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# AMERICAN JOURNAL OF CONCHOLOGY.

VOLUME V.

PUBLISHED BY THE

*Conchological Section of the Academy of Natural Sciences.*

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# AMERICAN JOURNAL OF CONCHOLOGY.

NEW SERIES.

PUBLISHED BY THE

CONCHOLOGICAL SECTION of the Academy of Natural Sciences of Philadelphia

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VOL. V.

1869-70.

PART 1.

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*Meeting January 7th, 1869.*

Eight members present.

DR. W. S. W. RUSCHENBERGER, Director, in the Chair.

Various donations to the Museum and Library were reported.

The following papers were offered for publication :

"Notes on the genera *Alaria*, *Diarthema*, *Dicroloma*, etc., being a supplement to an attempt at a revision of the Strombidæ and Aporrhaidæ." By Wm. M. Gabb.

"Description of a new *Helix* from Utah." By Wm. M. Gabb.

"Descriptions of new species of South American Fossils, No. 1, Tertiary." By Wm. M. Gabb.

A letter was read from Dr. Wesley Newcomb, stating that he had dredged one living specimen of *Lingula albida*, Sowb., at Monterey, Cal., which is far north of the hitherto ascertained northern limit of the species.

A note from Dr. Lea was also read, in which that gentleman asserted the priority of his name *Paludina bimondifera* over Mr. Conrad's name, *P. magnifica*, applied to the same species. The subject was referred to a committee.

On motion of Dr. E. R. Beadle, the following resolution was unanimously adopted:

Whereas, Prof. Wm. M. Gabb has, with great liberality, presented his entire private collection of Mollusca to the Conchological Section, thus greatly enriching and enlarging our collection, principally by the addition of a splendid series of authentically named specimens of nearly all the species inhabiting the Pacific States of the Union; Therefore, be it

Resolved, that the Recorder be directed to convey to Prof. Gabb the thanks of this Section for his valuable donation.

---

*Meeting February 4th, 1869.*

DR. RUSCHENBERGER, Director, in the Chair.

Donations to the Library were announced.

The following paper was offered for publication and referred to a Committee:

"Observations on Melantho." By Dr. James Lewis.

The following resolutions were adopted:

Whereas, Messrs. Parker, Roberts, Ford and Hassler have volunteered their services to arrange the shell collection of the Academy of Natural Sciences: therefore be it

Resolved, that they be constituted a Committee for that purpose.

Resolved, that this Committee be authorized to enter into correspondence with Scientific Societies, Public Museums and individuals, with a view to obtain by donation, exchange, or purchase, such species as may be required to complete our collection in those Families or Genera of which Catalogues have been, or may hereafter be published by the Section; provided that no purchases be made at the expense of the Treasury of the Section.

Resolved, that the Committee be authorized to sell duplicate specimens, and apply the funds thus accruing to their purchases.

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*Meeting March 4th, 1869.*

Ten members present.

DR. RUSCHENBERGER, Director, in the Chair.

Donations to the Museum and Library were announced.

The following papers were presented for publication and referred to Committees:

"Catalogue of the Family Corbiculadæ." By Temple Prime.

"On Lingual Dentition, studied by the Microscope and Photography." By Wm. G. Binney and Thomas Bland.

"Descriptions of Miocene, Eocene, and Cretaceous Fossils." By T. A. Conrad.

"Observations on the Genus *Astarte*, with Descriptions of two other Genera of *Astartidæ*." By T. A. Conrad.

"Notices and Reviews of New Conchological Works." By Geo. W. Tryon, Jr.

Mr. Tryon, on behalf of a Committee appointed at the January Meeting, read the following report :

HALL OF THE ACADEMY, February 9th, 1869.

The Committee appointed to ascertain and report to the Conchological Section whether Dr. Lea's *Paludina bimonilifera* has priority, as asserted by him, over Mr. Conrad's *P. magnifica*, respectfully report:

That Dr. Lea's species was included in a paper read by him before the American Philosophical Society, March 16th, 1832, and published in the "Transactions" of that Society, the title page of the completed volume bearing date 1837. But the volumes of the Philosophical Transactions were issued in Parts, with no internal evidence of the date of publication of each; nor do the records of the Society furnish these dates.

Dr. Lea claims, and Mr. Conrad has allowed, that the printed date of the species contained in the paper in question, is 1834, and by reference to the Minute-Book of the Academy of Natural Sciences, your Committee find that one of Dr. Lea's extra copies of his paper, under the title "Observations on the Genus *Unio*, etc.," was presented by the author to the Academy Sept. 16th, 1834.

Mr. Conrad's *Paludina magnifica* was first published by him in a small work entitled "New Fresh Water Shells of the United States," Philadelphia, 1834; and the editor of Silliman's American Journal of Science acknowledges receipt of a copy of this work in the No. of that Journal issued July 1st, 1834.

There is, consequently, no doubt of the priority of Mr. Conrad's species in *printed* publication. But Dr. Lea claims priority for his date of reading, asserting that at the early period referred to, Societies published infrequently, and in order to secure to an author the fruits of his labors, by almost universal consent, the date of reading was adopted as date of publication. Subsequently, as science became more active and larger numbers of persons became interested in it, this plan was found to be inconvenient, and a more rapid diffusion of discoveries was obtained by the issue by the principal scientific bodies, at frequent intervals, of cheap publications entitled "Proceedings." Thus small

papers entire, together with abstracts of larger ones, could be published so rapidly that giving the date of reading became superfluous, and it has gradually fallen into disuse—as it ought to do.

Your Committee find, upon examination, that all the principal Natural History Societies in the world gave “date of reading” to the memoirs published by them until some years after the period in dispute, (about 1845), and a few of these societies still give this date in their quarto publications, though not in their proceedings in octavo. The Academy of Natural Sciences commenced publishing its Proceedings in 1841, and discontinued its 8 vo. Journal in 1842. The last two volumes of this Journal contain numerous papers by Mr. Conrad and others, the date of reading being generally given even to his papers.

Your Committee recommend, in view of these facts, that priority be awarded to Dr. Lea’s species in the proposed new publication of the Conchological Section, inasmuch as the date of reading at the period in question was the almost universal rule for determining priority in publication, and we cannot endorse an *ex poste facto* law; but we cannot refrain from expressing a hope that the time is not far distant when the date of *printed* publication only shall be universally acknowledged in determining claims of priority.

GEO. W. TRYON, Jr.,	}	Committee.
W. M. GABB,		
E. R. BEADLE,		

Mr. S. R. Roberts reported the occurrence of *Sphaerium sulcatum* near San Antonio, Cal.

Mr. Tryon, referring to *Helix cultellata*, Thomson, remarked that it was certainly of European type, and he believed it had been introduced into California by European emigrants, as surmised by Mr. Thompson in a recent letter to a member of this Section.

DESCRIPTIONS OF SOME SECONDARY FOSSILS FROM  
THE PACIFIC STATES.

BY W. M. GABB.

Since the publication of the first volume of the Palæontology of California, a few undescribed species of Jurassic and Triassic fossils have been accumulated in the office of the Geological Survey; and the explorations of the Commission have developed the fact of the existence of these rocks over an extensive area in the States of California and Nevada. A large proportion of the stratified rocks of the western slope of the Sierra Nevada appear referable to Jurassic formation, while at least one small tract in Nevada yields fossils of this age in a reasonably good state of preservation.

From the paucity of species, and none being referable to described forms, we were unable, at the time of publication, to do more than designate the great group of the Mesozoic era to which they belonged. The discovery of two Ammonites, closely allied to known European species, together with other characteristic forms, lead us now to believe that all of the at present known Jurassic rocks of the Sierra and its vicinity belong to the Lias. The only known locality of these rocks in Nevada is the now deserted mining district of Volcano, about thirty miles south-east of Walker's Lake. The spot has never been visited by a geologist, and all we know of it is derived from the meagre and unsatisfactory accounts of uninstructed collectors who, while searching for mines, picked up the fossils incidentally on account of their beauty and novelty. I made two attempts to reach the spot in the fall of 1867, but was both times baffled; first by incorrect information, and again by the exhausted condition of my horses, worn out by several months travel in the inhospitable deserts of Southern Nevada. All of the collections that have been brought in from this locality contain an admixture of nearly equal proportions of Jurassic and Triassic fossils. One of the commonest of the latter is *Ammonites Ausseanus*, while of

the former, *Pecten acutiplicatus*, Meek, is by no means rare. In most cases, by carefully studying the lithological characters of recognized forms of the two formations, the new species can be assigned without difficulty to their proper group, though in some instances I am still in doubt.

The present paper is intended to be merely preliminary, it being the purpose of Prof. Whitney, in case of a resumption of the labors of the California Survey, to publish fuller descriptions, illustrated by proper figures of each species.

In addition to the descriptions, I have added a few notes on previously known forms, in amplification or correction of the original descriptions.

#### ORTHOCERAS, Brug.

O. BLAKEI, Gabb.—Pal. Cal., vol. I., p. 19, pl. 3, fig. 1.

This species is quite abundant at all of the Triassic localities of Nevada. A fragment before us, showing the remains of two chambers, has a diameter of 2·3 inches. Its entire absence of all ornament renders it very difficult to describe in such a way as to distinguish it from allied species. It is not unlike *O. dubium* of San Cassian, but it seems to be distinguished from that species by the septa being more closely placed, in the specimen just mentioned, the distance between each pair of the three septal margins being ·8 inch respectively. The septa also appear to be somewhat more concave in the present than in the European species.

#### AMMONITES, Brug.

A. NEVADANUS, Gabb.—Pl. 3, fig. 1, 1a.

Shell large, discoidal, compressed, many whorled; whorls increasing very gradually in size, sections quadrate, with slightly convex sides; dorsum tricarinate, the middle carina the highest; whorls in contact by their dorsal and ventral faces only. Surface marked by numerous, equal transverse ribs, separated by interspaces of about equal size; on the dorso-lateral margin, each rib bears a more or less distinct, small tubercle, after which the rib bends suddenly forward and merges into the dorsal carina of that side. Septum composed of a dorsal, a ventral, and a single lateral lobe on each side. The dorsal and lateral lobes are all broad, with the sides nearly parallel, and are divided at the ends for about a third of their length, into two branches; the corresponding saddles are simple and bifurcate; the ventral lobe is unknown.



*Dimensions*.—Diameter of the largest specimen, with eight volutions, 6·5 inches; section of outer whorl, vertical diameter, 1·2 in., transverse diam., ·9 in. The inner volutions have the two diameters about equal.

*Locality*.—Two specimens from Volcano. Jurassic. Collected by Mr. Clayton.

A very remarkable peculiarity of one of the specimens before me is represented on plate 16, Journal of Conch., 1868. The figure of the end of a broken whorl shows the position of the siphuncle to be in one of the lateral carinæ, the whole septum being carried over with it. The ventral lobe is obliquely opposite, on the angle of the umbilicus, and the lateral lobes are equally misplaced. The lateral lobe of one side is much larger than the other, and is much better developed, and the dorsal saddle of that side is nearly twice as wide as the corresponding opposite saddle. The line *d* represents the position of the median line of the dorsum; *s*, the position of the siphuncle, and *u u* the umbilical angles. This is, in all probability, only an individual distortion, but I am unfortunately unable, with the material in my possession, to prove my opinion.

As compared with known species, the present one differs from *A. bisulcatus*, Brug., in having the whorls higher than wide, while in that shell the reverse is the case; in *Nevadanus* the dorsal grooves occupy nearly the whole dorsum; in *bisulcatus* they take up less than a third of the surface, and in the latter species the dorsal ribs are much more prominent.

*A. bisulcatus* has a trifurcate superior lateral lobe, while in *Nevadanus* it is bifurcate.

*A. Bonardi*, d'Orb., has more numerous whorls, the ribs are curved and the whorls are proportionally narrower; it also has nearly the same style of septum as *A. bisulcatus*, but the dorsal saddle is tribolate. It differs from *A. Conybeari*, Sby., in the whorls being less numerous and wider, the dorsum flatter, and in the ribs being more distinctly bent as they approach the dorsal margin. *Conybeari* has lobes wide above, and narrow below, and the dorsal saddle is tribolate.

*A. COLFAXII*, Gabb.—Pl. 4, fig. 2.

Shell many whorled, flat, discoidal, whorls rounded on the sides and dorsum, emarginated on the ventral face, increasing very gradually in size. Surface ornamented by prominent radiating ribs with broad concave interspaces; these ribs start at the umbilical margin and cross the sides, straight or slightly sinuous, and apparently become obsolete on the dorsum. Septum; dorsal lobe unknown; dorsal saddle broad and deeply

bilobate; superior lateral lobe long, narrow and irregularly divided at the end into two branches, the lower of which is again divided; above these branches it has three unequal spurs on each side; lateral saddle divided into two branches; below these are four small lobes, much smaller than the superior lateral, but with apparently the same general structure.

*Dimensions* of a very much distorted specimen with eight whorls.—Diameter, 4.5 in., true diameter perhaps about 3.5–4 in.; height of body whorl, .9 in.

*Localities*.—From the Jurassic (Liassic?) slates of the west slope of the Sierra Nevada. One specimen from the cut of the Pacific Rail Road, "Station 2777, Sect. 53, one mile west of the town of Colfax;" another, very compressed, but recognizable both from its style of volutions and remains of septum, from Robinson's Ferry, on the Stanislaus River, given us by Mr. Pomier.

Both these specimens are much injured by distortion, and the septum can be traced only with great difficulty. The dorsal lobe is entirely obliterated, and the portion of the septum from the inferior lateral to the umbilical suture is so imperfectly preserved that I can only obtain it approximately. It is figured in Jour. Conch. 1868, Pl. 16, the upper of the two septa. The matrix is, in both cases, partially metamorphosed, and in the Colfax specimen the shell lies at right angles to the stratification of the rock, to which fortunate circumstance we are indebted for not having it pressed perfectly flat. In the other case, the shell lying parallel with the slate, it is mashed down to less than a tenth of an inch in thickness, and every rib is obliterated.

The present species is most closely allied to *A. solaris*, Phil., of the Lias, but it has more numerous whorls; *solaris* is slightly carinated, and the whorls seem to have been higher and narrower. So far as we can decide from the material known, *A. Colfaxii* is rounded on the back. It has more lobes than *solaris*, though of the same general style. The superior lateral in the latter species is more distinctly trifurcate.

*A. BILLINGSIANUS*, Gabb.—Pl. 5, fig. 3.

*Palæontology of Cal.*, vol. 1, p. 27, pl. 5, fig. 20.

When I described this species I could obtain but a very indistinct trace of the septum. Since then I have had the good fortune of finding a specimen showing the septum with unusual clearness. It consists of a dorsal, two lateral, and three small supplementary lobes. The dorsal lobe is narrow, bifurcate for more than half its length, each branch consisting of a simple



long point, bearing a double spur on the outer side; no lateral branches or spurs above. Dorsal saddle rounded, entire; superior lateral lobe simple above, bifurcate below, the branches unequal, the upper bearing a large spur on the outer side. Lateral saddle narrower than the dorsal and, like all the others, simple and rounded. Inferior lateral lobe of the same general pattern as the superior, but more slender, and the spur on the upper side more strongly developed. Beyond this are one large saddle and three small, spur-like lobes; the first and second placed obliquely to each other, the last, inside of the umbilical angle, being on the same level with its next neighbor.

#### TURBO.

? *T. REGIUS*, Gabb.—Pl. 5, fig. 4.

Shell large, massive, low-turreted, height and width about equal; whorls about six, flattened or slightly sloping on top, sides flattened, base slightly convex. Surface ornamented by large blunt tubercles on the upper angle, about ten to a volution, and by smaller ones, nearly obsolete on the lower angle; besides these the whole surface is covered by minute, slightly elevated revolving lines. Aperture subquadrate, inner lip slightly en-crust.

Length and width of body whorl, each, 2.4 in.; length of aperture 1.0 in.

*Locality*.—Volcano, Nevada, associated with *Ammonites Nevada-nus*. Found by Mr. Clayton.

The single specimen, on which I describe this species, is in a pretty fair state of preservation; showing the form and surface markings perfectly, but is somewhat broken about the outer side of the mouth. Enough however remains to show that, if not a true *Turbo*, it is as closely related to that genus as are any of the so-called *Turbos* of the Jurassic formation.

? *T. ELEVATUS*, Gabb.—Pl. 3, fig. 5.

Shell elongate, conical, spire elevated; whorls six or seven, sides converging, top slightly truncated and bearing numerous, regular, small tubercles or nodes, about 20 to a volution, which form a beaded rim, projecting a little laterally; body whorl flattened and converging on the sides, angulated below, base slightly convex and with small nodes on the lower, as well as upper angle. Aperture sub-elliptical, acute above.

Length 1.5 in., width of body whorl .85 in., length of aperture .65 in.

Found by Mr. Clayton, with the preceding.

While this shell is entirely different in shape from the preceding, it agrees with it in the general style of ornament. Both have flattened whorls, truncated above and angulated below, and both have heavy tubercles on the upper, and fainter ones on the lower angle. They can be at once distinguished, however, even as internal casts, by their marked dissimilarity of outline. The present shell is slender, and the spire is unusually elevated; the apical angle being about  $37^{\circ}$ , while the other has an angle of about  $70^{\circ}$  to  $80^{\circ}$ . In the present species I can detect no trace of revolving lines, though the surface of the specimen is in a nearly perfect condition, showing minute lines of growth distinctly.

PHOLADOMYA, Sby.

*P. MULTILINEATA*, Gabb.—Pl. 5, fig. 6.

Shell long, gibbous, beaks very prominent and placed about a fourth of the length from the anterior end, which is prominently rounded in the middle; base deep, nearly semicircular; posterior end produced in the middle, retreating above and below; cardinal margin nearly straight, posterior to the umbonal slope. Surface marked by about thirty small, irregular, radiating ribs, less distinct at the two ends.

Length 2.4 in., width 1.9 in., diameter 1.1 in.

Found at the same locality as the preceding by Dr. A. Blatchley.

This species is not unlike *P. elongata*, Münst., of the Neocomien, but is deeper from beak to base, is shorter and has more numerous ribs, though of the same general character.

*P. NEVADANA*, Gabb.—Pl. 5, fig. 7.

Shell small, very convex; beaks anterior, strongly incurved, umbones broadly rounded; anterior end sloping outwards, nearly straight above, convex in the middle, retreating below; base nearly straight posteriorly, most prominent directly under the beaks and curving upwards rapidly in advance; posterior end pretty regularly rounded; cardinal margin nearly straight. Surface ornamented by eight or ten small, but distinctly marked, radiating ribs, most prominent on the middle, fainter posteriorly, and entirely wanting on the anterior one-fourth; these are crossed by irregular lines of growth, covering the whole surface.

Length 1.8 in., width 1.3 in., diameter of both valves 1.2 in.

*Locality*—Volcano, Nevada. Mr. J. E. Clayton.

Most nearly allied to *P. Hausmanni*, Goldf., of the German Lias, but is smaller, has more ribs, and is narrower posteriorly.

## GONIOMYA, Agass.

G. APERTA, Gabb.—Pl. 6, fig. 8.

Shell very thin, subcompressed, gaping posteriorly; beaks small, prominent and placed about two-fifths of the length from the anterior end; cardinal margin rapidly sloping, with a slight convexity in advance, posteriorly concave at first, and running out nearly straight to the posterior end; anterior end narrowly rounded and prominent; posterior subangulated, being obliquely truncated above and below and produced in the middle; base broadly convex. Surface ornamented by numerous concentric ribs, broadly angulated, the angle being a little posterior to the beaks. These ribs are very uniform in size and, commencing at the anterior end, are coincident with the lines of the growth for about a third of their length, they then bend towards the base very slightly, become somewhat undulated and, when nearly one-third of the length from the posterior end, bend up somewhat abruptly, gradually resuming the direction of the striae of growth, and finally disappear near the cardinal margin.

Length 2·4 in., width 1·4 in., diameter of the valves ·9 in.

*Locality*.—With the preceding. Mr. Clayton.

This shell is more evenly ribbed, and the angle of the ribs is wider than in any other species with which I am acquainted.

## MYACITES, Münst.

M. DEPRESSUS, Meek.

*Myacites depressus*, Meek, Pal. Cal., vol. I, p. 51, pl. 8, fig. 6, 6 a.

A single specimen of this shell was found by Mr. Clayton at Volcano.

## CARDIUM, Linn.

C. ARCEFORMIS, Gabb.—Pl. 3, fig. 9.

Shell of moderate size, very thick, convex, oblique, longer than wide; beaks prominent, strongly incurved, in some cases almost in contact, placed about a third of the length from the anterior end, which is regularly rounded; posterior end variable, rounded or obliquely truncated; base pretty regularly and broadly convex. Surface ornamented by about 18 to 20 large convex, radiating ribs with interspaces of about equal size, all crossed by fine but distinct lines of growth. From 11 to 12 of these ribs occupy the anterior and lateral portions of the surface; the remainder, on the posterior face, are always smaller and, in some

cases, especially on old shells, are entirely obsolete. The internal margin is crenulated by a series of large teeth corresponding with the external ribs; anterior muscular scar enormously deep, posterior not discernible on the internal casts.

Measurements of two specimens:

Length, 1.05 in., width from beak to base, .85 in., diameter of two valves, .9 in.

Length, .95 in., width from beak to base, .83 in., diameter of two valves, .75 in.

From the Jurassic of Volcano. I have also received a specimen labelled "Uniontown, 40 miles south-west of Austin, Reese River, in the Union District." This is a deserted mining camp, about ten miles south of Ione. I found no fossils in this range, nor could I learn, while on the spot, that any had ever been discovered there. It is very probable that the shell was taken there from the Volcano District.

The present species is unlike any *Cardium* with which I am acquainted. At first sight it has all the appearances of an unusually robust and heavily ribbed *Arca*. On close examination, however, it shows no signs of an arca; the cardinal margin is rounded down at both ends, and on the internal cast the line of junction between the two valves is marked by an elevated ridge, laterally undulated, showing the outline of the characteristic teeth of the genus to which I have referred the shell.

ASTARTE, Sby.

A. APPRESSA, Gabb.—Pl. 5, fig. 10.

Shell very flat, obliquely subquadrate; beaks anterior, subterminal, small; anterior end nearly straight above, lower half convex; base and cardinal border equally convex, nearly parallel; posterior end broadly rounded; cardinal margin truncated, a narrow flat space, bordered by an angle running to near the posterior end; lunule long, narrow lanceolate, slightly impressed. Surface ornamented by large, angular, concentric ribs near the beaks, becoming less distinct and finally obsolete towards the base.

Length, 1.1 in.; width, .9 in.; height of single valve, .12 in.

*Locality.* With the preceding; Mr. Clayton.

This shell can be at once distinguished from *A. ventricosa*, Meek, from the same formation, by its longer, quadrate outline and flatter valves. The beaks of *ventricosa* are large, prominent, and project beyond the cardinal margin; while in the

present species they are minute, acuminate and point forwards. The truncation of the cardinal margin of our shell is also a marked difference; while the surface markings of the two species are entirely unlike.

## CARDINIA.

? *C. PONDEROSA*, Gabb.—Pl. 6, fig. 11, 11a.

Shell large, elongate, sub-oval, very thick; beaks a little more than a fourth of the length from the anterior end, very small, placed close together; ends broadly and nearly equally rounded, anterior a little the narrowest, cardinal margin slightly arched; base very broadly convex, nearly straight; immediately under the beaks the outline is very slightly emarginate; lunule none; ligament moderate in size, narrow, not prominent. Surface marked by rough, irregular lines of growth closely placed. Internal margin entire; pallial line strongly marked; muscular scars shallow.

Length, 3·7 in.; width, 2·25 in.; diameter of both valves, 1·6 in.; thickness of shell in the middle of the valve, ·28 in.

Found by Dr. A. Blatchley at New Pass, near Austin; Trias. I have seen several impressions in the slates of Star Cañon, which I believe to belong to the present species, but all are more or less distorted and flattened, and in none are there any portions of the shell preserved.

The specimen from which the above description is taken is in a remarkably good state of preservation, the valves are in contact, and, although slightly broken, show the entire outline and all of the other specific characters perfectly. By careful manipulation I succeeded in not only separating the valves, but in detaching most of the shell from the interior mould, although the entire shell substance is extremely friable, being replaced by crystals of dolomite. I was not, however, fortunate enough to see all of the hinge, a portion of it crumbling away. So far as could be ascertained, it possesses more the appearance of *Cardinia* than any other described genus, and I have therefore so referred the species, despite the very thick shell structure. A marked peculiarity of the crystallization is that the crystals are deposited in two distinct layers, a well-defined plane of separation running parallel with, and about mid-way between the outer and inner surfaces, throughout almost the entire shell.

## POSIDONOMYA, Brown.

*P. BLATCHLEYI*, Gabb.—Pl. 6, fig. 12.

Shell large, flattened, obliquely sub-circular; beaks small,



nearly central, cardinal margin not so long as the width of the shell, straight for a short distance both sides of the beaks, then bending down with a regular curve posteriorly, sub-angulated anteriorly; base narrowly rounded, most prominent directly opposite the posterior end of the cardinal line; anterior end, with a portion of the base, forming about a third of a circle; posterior end less convex. Surface marked by irregular and not very prominent concentric lines and undulations.

Length, 1.45 in. ; width, 1.5 in.

*Locality.* Found by Dr. A. Blatchley in the Trias at New Pass, west of Austin, associated with many species, characteristic of the St. Cassian group of Europe.

It is most nearly allied to *P. Bronnii*, Goldf., but is more regularly rounded in outline, and wants the angle at the posterior end of the cardinal line. The surface ribs are also less strongly marked than in that species.

#### PINNA, Linn.

*P.*——. sp. indet.

Two fragments of a *Pinna* were obtained by Prof. Whitney, at Mormon Station, Plumas Co., Cal., in the semi-metamorphosed sandstones of the Jurassic. They are long, slender, and are marked very much in the same manner as *P. Brewerii*, nob., of the California cretaceous. Both specimens have suffered some distortion, and, until better material shall have been obtained, I do not feel warranted in giving a detailed description.

#### CASSIANELLA, Beyrich.

*C. LINGULATA*, Gabb.—Pl. 5, fig. 13, 13a, 13b.

Shell very thick, long, narrow, linguæform. Large valve, very convex and ponderous, nearly as high as wide; beak placed in the middle, prominent, strongly incurved, umbone high, rounded; posterior ear straight, slightly sloping, sub-acuminate, lateral margin slightly concave; anterior ear more elevated than the posterior, separated from the body by a marked groove, top convexly sloping, lateral margin nearly straight; below the ears the sides are nearly parallel for a short distance, curving into a broadly rounded base. Hinge line broad, widely open, areas of both valves wide, that of the smaller valve triangular notched opposite the beak of the opposite side. Small valve thin, broadly concave, divided by two radiating ridges into three unequal concave surfaces; outlines corresponding with those of the opposite valve, where in contact. Surface of both valves

covered by not very prominent lines of growth. Length from beak to base, 1·6 in.; transverse width below the ears, ·75 in.; length of two ears about ·9 in.

From another specimen the width at the base of the ears is 1·1 in.; diameter of two valves at same point, ·9 in.; thickness of large valve in the middle, ·35 in.; height of top of umbone above the hinge, ·4 in.

The length of the hinge line in this specimen has been about 1·6 in., and the total length nearly 2 in.

*Localities.* Casts of this species are common in the Trias of Star Cañon, Nevada, whence they were brought in 1863 by Mr. Homfray, but it has only been within a year or two that the shell has been found. One or two mutilated specimens were obtained by Mr. Clayton, at Volcano, which thus give us the means of adding another link to the chain of evidence, of the near synchronism of the Trias of Nevada with that of St. Casian.

The species can be distinguished from its European congeners by its unusually elongate form, being twice as long from beak to base as its width below the expansion of the ears. *C. gryphæata*, Münst., its nearest ally, is very much smaller, the length and width are about equal, its umbones are much less prominent, the groove between the body and anterior ear is deeper, and, while it has two radiating ridges on the right valve, these ridges, unlike those of our species, are broad and round, instead of being sharply defined ribs. *C. tenuistriata*, Münst., and *C. decussata* Münst., are sufficiently distinguished both by their shape and surface sculpture.

#### LIMA, Brug.

L. (PLAGIOSTOMA). Sp. indet.

Associated with the *Pinna*, above mentioned, from Mormon Station, Plumas Co., are the mould and impression of a shell of this genus, showing enough of the surface markings to ally it closely with those smooth, semi-polished and finely radiated species so strongly characteristic of the English Lias. It is about an inch in length, has the anterior ear well developed, and resembles in general shape and convexity the English *Plagiosomas*.

#### MONOTIS, Bronn.

M. CIRCULARIS, Gabb.—Pl. 7, fig. 14, 14a.

Shell large, flattened, nearly circular, beaks small, median; anterior side, base and posterior side forming a regular, con-

tinuous and nearly equal curve throughout; cardinal margin nearly straight and two-thirds as long as the width of the shell, ending anteriorly by a slight angle; posteriorly produced into a prominent ear a little longer than high. The lateral face of the ear is slightly emarginate below. Surface closely sculptured by very faint, flat, radiating ribs separated by linear depressions, the whole crossed by numerous minute and very regular concentric lines. Internally the radiating ribs are even more strongly marked than on the surface.

Length, 3.25 in., width, from beak to base, 3 inches, greatest diameter of the two valves .8 in.

*Locality.* Rare at New Pass, near Austin, Nev.; from the Trias; found by Dr. Blatchley.

This species resembles in outline *M. substriata*, Münst., of the Lias, but is much larger and even more round than that shell. The surface is also entirely different. From *M. salinaria*, Bronn, and *M. sub-circularis*, nobis, of the same formation in which it is found, it is distinguished both by outline and surface; though in the presence of the anterior angle it approaches the former of these.

#### PECTEN, Brug.

Three species of this genus are represented in the collection, each by a single specimen. Two of these are flat and characterized by fine radiating ribs; the third is convex, and the fragmentary internal cast resembles strikingly the deep valve of the Cretaceous genus *Neithea*. They are all from Volcano, the last undoubtedly from the Jurassic. In regard to the age of the others I am in doubt, whether to refer them to the Jura or Trias.

*P. acutiplicatus*, Meek, is common at Volcano.

#### PLICATULA, Lam.

*P. PERIMBRICATA*, Gabb.—Pl. 6, fig. 15a.

Shell of moderate size, inequivalve, more or less inequilateral, sometimes slightly oblique; sometimes free, sometimes apparently attached by the flat valve. Sides and base broadly and pretty regularly rounded; the right side sometimes a little more prominent than the left; this rounding continues from a half to two-thirds the length of the shell, after which the sides rapidly converge towards the beak. Surface of the upper valve convex, and somewhat prominent in the middle, falling very gradually to the base and convex portions of sides, more rapidly towards the beak and superior lateral margins. Both valves marked by



pretty regular and strong imbricating concentric ridges, and by radiating plications; the latter most marked on and towards the edges of the imbrications. Lower valve variable, flat, slightly convex or slightly concave. In two instances out of five specimens this valve appears to have been attached to another body during the life of the animal; and in one of these cases, where it is now separated, while the characteristic markings are discernible, they are blurred, and combined with oblique striation from the other surface. In at least one other case this valve seems to have been entirely free, and the radiating sculpture is even stronger than the concentric.

*Dimensions* of the largest specimen: length from beak to base, 1.3 in.; width, 1.05 in.; height of deep valve, .2 in. From a smaller one: length, as above, 1 in.; width, .95 in.; diameter of both valves, .25 in.

*Locality.* Brought from the Jurassic of Volcano, by both Mr. Clayton and Dr. Blatchley. One specimen is in the same block with the *Astarte*, above described.

This shell resembles *P. spinosa*, Sby., of the European Lias, but is less oblique and has many more of the concentric imbricating ribs.

#### SPIRIFER, Sby.

*S. obtusus*, Gabb.—Pl. 7, fig. 16, a, b.

Shell robust, short, thick, valves very convex; base regularly convex, nearly semi-circular, lateral angles rounded off and converging into the hinge line; dorsal valve almost as long as wide, deep; beak elevated, somewhat incurved; mesial sinus regularly concave, strongly marked; area shorter than the width of the shell, very broad, foramen large; ventral valve less convex than the dorsal; beak small, incurved; mesial fold elevated, sub-angulated and bearing three ribs on the upper surface and one on each side on the slope. Surface ornamented by about twenty-three or twenty four rounded ribs on each valve, of which three or four belong to the mesial fold and sinus. These ribs are separated by equal, concave interspaces; all crossed by small, sub-imbricating lines of growth.

Length from apex to base of ventral valve, 1.3 in.; of dorsal valve, 1 in.; width, 1.35 in.; length of area, 1.15 in.; distance between the two beaks, .28 in.; greatest diameter of two valves, .95 in.

*Locality.* Two specimens from the Trias of Volcano, from Dr. Blatchley.

This shell resembles most *S. Keokuk*, Hall, of the Carboniferous of Iowa, (See Geol. Rep. Iowa, part 2, pl. 20, fig. 3, a, b.) but in that species the mesial fold of the ventral valve is composed of two large ribs. The beak of the dorsal valve is not so distinctly incurved in the present species; the area is shorter, broader and higher, and the sides of its dorsal valve, from the beak to the angles, slope more rapidly than in *S. Keokuk*. The mesial sinus is also more prolonged at the base than in the Iowa shell. The resemblance is rather one of outline than of detail.

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NOTES ON THE GENERA ALARIA, DIARTHEMA, DICROLOMA, &C.; BEING A SUPPLEMENT TO "AN ATTEMPT AT A REVISION OF THE STROMBIDÆ AND APORRHAIIDÆ."

BY W. M. GABB.

In the last volume of the Journal of Conchology I published a paper on the two families of alate shells, in which I attempted to arrange all of the genera as nearly in accordance with the views entertained by students of the living forms, based on a study of the animals, as our knowledge of their analogies would permit. I pursued this course, not without some hesitation, because, though the living representatives of both families are sufficiently distinct, when we take up the paradoxical forms of the secondary formations, and especially of the Jurassic rocks, we encounter shells, the relations of which are almost impossible to decide, if, as a basis, we start with the idea of two distinct families. In view of this difficulty, several of the ablest students have preferred to class them together. Pictet (Paléontologie Suisse, 1860), calls them all *Strombidae*, while, more recently, Stoliczka (Pal. Indica, 1867,) proposes the new term *Alata*, a name very appropriate in its etymology, but not admissible, inasmuch as it has not the termination required by custom for all family names. If we permit these close resemblances to guide us, it is difficult to say where we will stop. Grant that the two families should be consolidated; the next question that arises is, where are we to draw the line between the family thus constituted, and the *Cerithidae*? The analogies between *Aporrhais* and *Cerithium* in the animals have been long known, and is there not strong ground for supposing that Piette's *Eustoma* should serve as the connecting link? Or further, on the other hand, should not *Alaria*, *Diartema* and *Spinigera* unite them with *Ranella*?

A parallel case of two very distinct modern families becoming confused and apparently blending, as we go back in the geological scale, occurs in the *Aviculidae* and *Pectenidae*. No one

would be apt to confound *Peeten* and *Avicula*, but it is not so easy to decide where to place the carboniferous *Aviculopecten* or *Eumicrotis*.

In the present instance the greatest difficulty lies among those shells that have been usually described as *Pterocera*. Since the establishment of *Alaria* by Morris and Lycett, many of them have been placed under that genus, hardly more appropriately than under *Pterocera*, and without contributing at all towards the solution of the difficulty. As originally described, and as accepted by Pictet, Piette and others, *Alaria* includes all the doubtful forms more or less fusiform and resembling (and many very distinct from) *Rostellaria*, but without a posterior canal. Some of those possess well marked varices, the results of arrests in growth, like those of *Ranella*, while others are entirely destitute of them. For the first of these two classes I have proposed to retain Morris and Lycett's name; for the other I suggested the name of *Dicroloma*. This is a division warranted by the views of all Conchologists; the presence or absence of varices being, in the great majority of cases, a character of even greater than generic value. The authors of the genus proposed to include everything that could be placed in, what they considered, *Strombidae*, and that simply differed from their views of *Rostellaria* and *Pterocera*, in the absence of the posterior canal running up the spire. In restricting the genus, therefore, it is necessary to follow the usual rule of ascertaining what are the characters of the first species described under the generic name. That species is *A. armata*, which forms a tri-digitate lip when young, that lip remaining as a varix on the older shell. My name *Dicroloma*, therefore, must be applied to the allied shells, fusiform in shape, without posterior canal, and with a bi-, tri- or multi-digitate outer lip and thin inner lip.

Since the publication of the paper above referred to, I have received from my friend, Dr. Ferd. Stoliczka, the first part of his admirable work on the Gasteropods of the cretaceous formation of India. He there goes over the question very ably, and proposes what he admits is only an artificial and temporary classification. I cannot concur with the Doctor in all the views he has advanced, and propose, after copying his table, to point out wherein we differ, and my reasons for holding other views. He proposes:

"1st. To restrict the name *Alaria* to the species with a simple undivided and narrow wing, as the Jurassic *Al. hamus*, Desh., and *Al. rhinoceros*, Piette and Desh.

"2d. Species which have the exterior termination of the wing extended in two opposite directions, (as *Rostellaria carinata*,

Mont.), and possess a long anterior canal, could form a small group, designated by Conrad *Anchura*.

“ 3d. Broad winged shells with only a single point to the posterior external termination, as *Rost. Orbignyana*, Pictet, or *Rost. papilionacea*, Goldf., might be designated under a separate name.

“ All these three forms are generally ornamented by transverse ribs.

“ 4th. Species with slightly dilated wing, soon dividing into two or three long extremities, carinated and usually spirally striated whorls, etcet.—as the long known *Al. myurus*, Desh., or *Al. levigata*, Morris, might be referred to *Tessarolar*, Gabb.

“ 5th. To retain under *Aporrhais* only those species which have a broad dilated wing from the base, terminating exteriorly in as many points as there are keels on the exterior side of the wing, which ought in all cases to extend to the exterior margin of the wing, as in *Ap. Dupiniana*, D’Orb., or *Ap. (Chenopus) atractoides*, Desh.

“ 6th. The Jurassic *Diarthema paradoxa*, Desh., forms a separate genus, somewhat allied to *Ranella*.

7th. *Spinigera*, D’Orb., ought probably to be classed here rather than with *Ranella*.”

For convenience I shall take up each division seriatim :

1st. As I have already shown, *Alaria* should be applied only to those species possessing a varix. Neither *A. hamus* nor *A. rhinoceros* possess varices, and I do not consider the fact of one rather than two or more processes on the lip of generic value, especially since such species as *A. hamus* show a very perceptible tendency to a second process, in the existence of a carina on the whorl, and an angle on the margin of the lip at the termination of the carina. I shall therefore place these shells in *Dicroloma*, at most as a subgeneric division.

2d and 3d. *Anchura*, Conrad, must include all those cretaceous shells of a long fusiform shape, without varices or arrests of growth of any kind, with a thickened inner lip, and with the outer lip expanded, broad or narrow, bearing a projecting process posteriorly, and (or without) one anteriorly on the outer margin. This genus differs from the preceding, as well as from its ally *Alaria*, in the inner lip being always more or less and usually strongly thickened, while in those genera the inner lip is very thin and generally obsolete.

The details of form of the outer lip must take a secondary



rank, since this character differs in every species. In fact it is of only specific value. *A. carinata* and *A. abrupta* are very closely allied, but they should not be separated as a distinct generic group, because, although we do not possess an unbroken series of gradations from them to such shells as *A. papilionacea*, yet we have many good links in the chain. *A. falciformis*, nob., has, in some individuals, a strongly marked angle at the outer anterior margin of the lip, and is not the rounded lobe on the anterior margin of *A. papilionacea* or of *A. Parkinsonii*, the rudiment of the same member? I cannot find any grounds for generic division among such shells as *A. abrupta*, Con., *A. carinata*, Mant., *A. falciformis*, Gabb, *A. Requieniana*, D'Orb., *A. simplex*, D'Orb., *A. Parkinsonii*, Sby., *A. Orbignyana*, Pictet, *A. Californica*, Gabb, *A. Robinaldina*, D'Orb., *A. rostrata*, Gabb, and *A. papilionacea*, Goldf.

4th. Dr. Stoliczka evidently misunderstands the genus *Tessarolox*. It is a digitate shell, one of the most marked characters being the long, well marked posterior canal running up the spire. It includes but two species with which I am acquainted, both cretaceous—*T. distorta*, nob., in California, and *T. bicarinata*, D'Orb., (*Pterocera*) in France. It possesses a peculiar style of ornament in clavate tubercles on the middle of the body whorl, and differs from *Helicaulax*, nob., in having the spire more or less encrusted with a thin callus, having also a thin inner lip. In the latter genus the spire is naked and the inner lip is covered by an unusually heavy callus, while the outer lip in all the known species is simply hooked, not digitate.

5th. Such shells as *Aporrhais attractoides*, *A. pagodus*, *Chenopus camelus*, *C. vespa*, &c., can hardly be called congeneric with *Aporrhais pes-pellicani*, and should receive another name.

6th. *Diarthema* is a good genus, founded on *Pterocera paradoxa*, Desh., and included by Morris and Lycett in *Alaria*. It is a comparatively short, sub-fusiform shell, with a short anterior and no posterior canal, no digitations on the outer lip, and two varices like *Ranella*.

7th. I proposed to place *Spinigera* near the true *Rostellarias*, but am now inclined to the opinion that its true relations may lie nearer to *Alaria* and *Diarthema*. It seems not improbable that these shells, bearing varices, may eventually, when we shall know more of the subject, be elevated to the rank of a distinct group.

Dr. Stoliczka considers *Eustoma*, Piette, as probably more nearly allied to the *Cerithidæ* than to the "*Alata*." Its long fusiform shape, the long straight canal, and even the form of the outer lip, seem to me to point to relations with such shells as

the present group, rather than with *Cerithium*. The manner of junction posteriorly, between the outer and inner lip, and the form of the latter are only exaggerations of what occurs in *Anchura*. (See for example *A. Mexicana*, nob.) From Piette's figures, by which alone I know the genus, it appears to be an *Anchura*, deprived of its expanded outer lip, and with the *stump* thickened.

There is yet much to be done before we shall have arrived at a full understanding of the alate and digitate shells of the secondary rocks; but until we shall have become better acquainted with some of the numerous species, as yet only known from fragments, the final classification of the genera must remain an open and perhaps a disputed question. If I have thrown any light on it, or if I only succeed in attracting the attention of other students to the subject, I shall be perfectly content.

## DESCRIPTION OF A NEW HELIX FROM UTAH.

BY WM. M. GABB.

*H. HAYDENII*, Gabb.—Pl. 8, fig. 1.

Shell of moderate size, orbicular; spire slightly elevated; whorls  $5\frac{1}{2}$ , rounded; suture well marked; last whorl descending very slightly above to the aperture; umbilicus funnel-shaped, perspective, occupying about a fourth of the base; aperture circular, oblique, margins simple or very slightly thickened, continuous, not reflected. Surface covered by prominent, elevated, revolving ribs, acute and with concave interspaces. These ribs vary from nine to ten in number, and, in some specimens, in the interspaces, are faint revolving lines, entirely absent in others. Crossing the revolving sculpture are numerous, irregular, well marked lines of growth. Color unknown.

*Figures.* Natural size.

*Locality.* Webber Cañon, near Salt Lake City, Utah, where dead specimens were found in abundance associated with *H. Cooperii*, by Dr. F. V. Hayden.

*Observations.* Dr. Hayden collected at the above locality perhaps as many as fifty specimens of this shell, of all ages. The young show that the circular aperture is not a constant character, since, until fully adult, the mouth is of the same shape as in *H. Cooperii*, which also, in fully mature individuals, not infrequently has a continuous peristome. The apical angle is the same in these specimens as in the unusually flat form of *H. Cooperii* associated with them.

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## DESCRIPTIONS OF NEW SPECIES OF SOUTH AMERICAN FOSSILS.

No. 1. TERTIARY.

BY WM. M. GABB.

I have received from Dr. Antonio Raimondi, of Lima, Peru, a fine series of fossils of that Republic, one of the results of about eighteen years of explorations and collection in all parts of the country. The series includes suites of Tertiary, Cretaceous, Jurassic and Carboniferous age, many of them in a beautiful state of preservation; many more too imperfect for determination. It is the intention of Dr. Raimondi to publish a large work on the Geography, Geology, Natural History, &c., of his country, and he has placed this material in my hands to enable me to prepare the volume on Palæontology. In view of the long time which may elapse before the appearance of the volume, I propose to describe the new species in the present form, as a preliminary, and hope to be able to hereafter republish them with elaborate illustrations and more extended notes.

The present paper is devoted to a series of fossils collected in the vicinity of Payta, Peru, from some bluffs of Tertiary sands. They vary considerably in lithological character and may belong to two or more different eras. One set of four or five species is made up entirely of extinct forms, while the remainder, more nearly allied in appearance, seem to be, from the balance of living and extinct species, on or near the horizon of the Pliocene. The notes accompanying the collection are meagre, and indicate little beyond locality.

FUSUS, Lam.

F. PAYTENSIS, Gabb.

Shell small, broadly fusiform, spire elevated; whorls about six (extreme tip broken), flattened and sloping above, slightly convex on the sides; body whorl prominently convex above,

concave and regularly tapering below. Aperture broad above, tapering in advance, canal (from line of growth apparently) straight, moderate in length and narrowed to the extremity. Surface ornamented by long, narrow tubercles, most prominent on the angle of the whorl, each sending a faint rib to the suture above and, on the body whorl, suddenly ending with the greatest convexity of the surface. There are eleven of these on each whorl; they are crossed, except on the top of the whorl, by numerous moderately large revolving ribs, smaller in advance.

Length about (broken) 3.9 in.; width, 2.8 in.; height of spire, 2.2 in.: approximate total length, 5.2 in.

Associated with the following. These two shells are of nearly the same size, but the smaller and more numerous tubercles, and the more slender form of the present species will distinguish them at a glance.

#### TRITONIUM, Link.

##### T. PERNODOSUM, Gabb.

Shell small, very robust; spire high, longer than the aperture; whorls six and a half, constricted above and below, close to the suture and bearing large, very prominent tubercles, about seven to a volution. These tubercles are isolated, more or less square, longer than wide, have broad interspaces and are placed on the middle of the upper whorls and on the upper part of the body whorl; on the body whorl they are proportionately smaller and wider apart, and below them the whorl is rapidly narrowed in advance. Besides the tubercles there are about a dozen well marked revolving ribs somewhat alternated in size. In one specimen two large ribs with a smaller one interposed cross the tubercles. Body whorl short and broad; aperture nearly circular, canal very short; inner lip lightly encrusted. Varices obsolete.

Length, 4.5 in.; width, 2.8 in.; height of spire above the suture of the body whorl, 2.3 in.; approximate length of the aperture (broken in advance), 2.2 in.

From a light greyish brown sandstone near Payta.

#### PURPURA, Brug.

##### P. CHOCOLATUM, Duclos.

*Purpura chocolatum*, Duclos, Ann. Sc. Nat., Vol. 26, pl. 2, fig. 7.

A single specimen of this species is in the collection. It is from a rock made up entirely of comminuted shells cemented by

carbonate of lime. No other specimens from this rock were sent. It is labelled "Immediate vicinity of Payta."

#### AMPULLINA.

##### A. ORTONI, Gabb.

Shell of moderate size, sub-pyriform; spire moderately elevated; whorls seven, flattened on top, rounded on the angle; suture channelled by a very narrow groove; body whorl broadly convex above the middle, tapering in advance; marked only by lines of growth. Aperture broad, rounded in front; outer lip simple; inner lip encrusted by a thin plate ending in front at the umbilicus. Umbilicus imperforate or characterized by a very small opening; running into it, and bordering the inner lip in advance is a flattened margin, ending abruptly on the outer side and merging in front into the margin of the aperture.

Length, 2 in.; width, 1.5 in.; length of aperture, 1.6 in.

Specimens of this species were sent me by Dr. Raimondi, in very imperfect condition; but I have been so fortunate as to have had the opportunity of studying a few fossils brought by Prof. Jas. Orton from the same locality, and among them is an excellent specimen of this shell, from which I obtain the specific characters. As compared with *A. mutabilis* of the French Eocene, it agrees in general form, in the sub-pyriform shape, the compressed tops of the whorls and in the channeled suture. It differs, however, in the inner lip, which, in our species, is more like a specimen before me labelled *A. patula*, of the English Eocene. In *A. Ortoni*, however, the incrustation above and behind the umbilicus is much heavier and more defined on its edges than in *A. patula*.

#### CERITHIUM, Brug.

##### C. LÆVIUSCULUM, Gabb.

Shell very long, slender, whorls numerous, increasing very gradually in size, sub-flattened on the sides, curving in above and below to the suture which is distinctly impressed. Surface marked only by lines of growth, which are obsolete, except on the last whorl where some are distinctly marked. Aperture sub-quadrate, outer lip sinuous, projecting below; inner lip obsoletely incrusted; canal short, twisted, notch faint.

Length, (less the tip) 4.2 in.; total length about 5.2 in.; length of aperture, 1.3 in.; width of body whorl, 1.4 in.

From Prof. Orton, associated with the preceding species.

Two shells are in Dr. Raimondi's collection, one from between

Huandoval and Corongo, Prov. of Conchucos, the other from near Ollon, Prov. of Cajatambo, both of which he considers Jurassic, and which, in the imperfect state of preservation, I cannot distinguish from the present species. The shell from Ollon is entirely unlike the recognized Jurassic fossils of that locality, in its lithological characters, and I suspect that there may be a deposit of Tertiary there, which has been confounded by the Doctor with the other fossiliferous rocks. *C. laeviusculum* is allied to *C. leve*, Quoy, from Australia, but its whorls are higher and less numerous, its apical angle is much narrower, the last whorls are more convex, the canal is less twisted and the mouth is longer.

#### LITTORINA, Fer.

##### L. LAQUEATA, Gabb.

Shell small, elevated trochoid; spire high, whorls five and a half, rounded, converging toward the suture, strongly sculptured by heavy, slightly oblique, longitudinal ribs a little narrower than the interspaces; these ribs commence just below the suture and on the body whorl end at the margin of the base; they are about twelve in number to a revolution and are crossed by a few elevated, revolving threads; base ornamented by closely-placed revolving ribs, showing a slight tendency to alternate in size. Aperture sub-circular; inner lip narrow, flattened.

Length .5 in.; length of aperture .2 in.; width of body whorl .31 in.

Found associated with *Fusus Paytensis* and *Tritonium pernodosum*.

#### VOLUTILITHES, Swains.

##### V. PLICIFERA, Gabb.

Shell elongate, fusiform, spire elevated, whorls (number unknown, apparently five or six?) flattened on the sides. Body whorl with a narrow sloping shoulder near the suture, straight below for a short distance, and then gradually converging in advance. Surface ornamented by about twelve or fourteen straight, longitudinal ribs or folds, starting at the margin of the shoulder and ending at the point where the sides begin to converge. Aperture long, narrow; inner lip with two (?) small oblique folds.

This species is described from a number of internal casts, and I should not have ventured to characterize it, were it not for its close resemblance to a species of the Tertiary of California and Oregon. The most perfect fragment, less a portion of the spire

and anterior end, measures—length 1·8 in.; probable total length a little over three inches; probable length of aperture 2·2 in.; width of body whorl 1·2 in.; width of aperture ·6 in.

From the casts and impressions, I am satisfied that the shell has had no other surface markings except the plain, rounded, longitudinal ribs, in which character it resembles *V. indurata*, Con., found in the Miocene and Pliocene of Oregon and California. It differs from that species in having more ribs, in their being straighter, and in the tips of the whorls being regularly sloping. In the North American species I could never succeed in uncovering the columella sufficiently to satisfy myself of the presence of the characteristic plaits. In the present shell I have detached traces of two, if not three, and now suspect that they will eventually be also found in the other.

All the specimens of this species are from a hard, yellowish claystone, containing *Pholas Chilensis*, Molina, and the *Thracia*, described below. No other species of this paper appear to have come from the same rock.

#### TURRITELLA, Lam.

##### T. COCHLEIFORMIS, Gabb.

Shell elongate, slender; whorls numerous; concave and sloping above and bearing a little below the middle, two sharp, strongly elevated revolving ribs with a concave interspace; below these is a third rib, less prominent and separated by the same distance as that between the others. On the last volution it forms a part of the base, while on the upper whorls it unites with the upper margin of the succeeding whorl, placing the suture a little above the middle of a regular concave space. Aperture sub-quadrangle, base slightly convex and having but the one rib mentioned above.

Numerous fragments of this species are associated with the *Fusus*, *Tritonium*, and *Littorina*. It is closely allied to *T. cochlea*, Rve., Leon. Conch., Sp. 29, but differs in the two carinæ being close together, and in having but one rib on the base instead of the two in Reeve's shell. The latter is described without a locality.

#### DACTYLINA, Gray.

##### D. CHILOENSIS, Molina.

*Pholas Chilensis*, Molina, Hist. de Chile, p. 179.

*id.* Gmel., Syst. Nat. p. 3217.

*id.* Gay, Hist. de Chile, p. 381, pl. 6, fig. 3.

*Dactylina Chilensis*, Chenu, Man. de Conch. v, 2, p. 4, fig. 14, 15.



A single specimen, still imbedded in the mould of its nest, from the same rock as the *Volutilithes* and *Thracia*.

RÆTA, Gray.

R. GIBBOSA, Gabb.

Shell large, thin, gibbous, broadly ovate; anterior end broadly and about equally rounded; posterior end narrowly and compressedly beaked; beaks central, small, incurved; cardinal margin sloping down about equally on both sides; base broadly and regularly convex. Surface ornamented by irregular concentric folds.

Length 3 inches, width from beak to base 2.5 in., diameter 1.6 in.

From a compact yellowish clay-stone, associated with *Volutilithes*, &c.

Closely allied to *R. canaliculata*, Say, from the coast of South Carolina, but more equilateral, less produced in advance, the greatest prominence of the posterior end placed higher (or nearer the beaks) and the bases more prominently convex. The surface plications are also finer and more numerous.

STRIGILLA, Turton.

S. PRORA, Hanley, sp.

*Tellina prora*, Hanley, Zool. Proc. 1844.

*id.* Hanley, Thes. Conch. p. 243, pl. 60, fig. 152.

*T. (Peronæoderma) prora*, H. and A. Adams, Gen. Rec. Moll. p. 396.

A single specimen, apparently from the same rock as the *Ampullina*.

CARDIUM, Linn.

*S. Gen.* LEVICARDIUM, Swains.

C. (L.) PERTENUE, Gabb.

Shell very thin, gibbous, somewhat inequilateral, most produced posteriorly; beaks small, strongly incurved; cardinal margins equally and regularly sloping; base broadly rounded, continuously to the middle of the anterior end, where the curve joins the nearly straight slope from above, with a narrow angle; posterior end apparently considerably produced (from the lines of growth, the lower part being broken). Surface very smooth, only marked by minute lines of growth.

Length (broken) 1.8 in., total length apparently 2 in., width from beak to base 1.75 in., diameter 1.45 in.



A very convex shell, which, when perfect, seems to have been unusually long on the posterior side, and more convex than any living species with which I am acquainted. It is remarkable for its excessive thinness, which is so marked that the specimen before me shows distinctly the color of the internal coat, through the shell substance.

# MYTILUS, Linn.

## M. UNGULATUS, Linn.

*Mytilus unguatus*, Linn., Gmel., Syst. Nat. No. 12.

A common species of the Chilian Coast. In a loose sandstone, probably the same as that containing the first two species of this paper.

# ARCA, Linn.

## S. Gen. SCAPHARCA, Gray.

## A. (S.) RAIMONDII, Gabb.

Shell long, slender, sub-compressed, very inequilateral; anterior end rounded; posterior end very obliquely rounded, sub-truncate; base nearly straight; beaks about a third of the length from the anterior end, approximate, incurved and pointed slightly in advance. Area narrow, about two-thirds as long as the shell. Surface marked by about thirty square radiating ribs with flat interspaces of about equal width. Internal margin marked by folds corresponding to the external ribs.

Length 2 in., width 1.2 in., diameter .75 in.

Not unlike *A. lima*, Rve., Icon. Conch., No. 101, but less rounded in general outline. The base is more straight, the posterior truncation more marked and the beaks more prominent.

# AXINÆA, Poli.

## A. PAYTENSIS, D'Orb., sp.

*Pectunculus Paytensis*, D'Orb., Amer. Merid. p. 129, pl. 15, fig. 11—13.

*Pectunculus Paytensis*, D'Orb., Prod. Pal. Strat. Vol. 3, p. 122, No. 2307.

One of the most common shells at the locality, judging from the number of specimens I have seen. Prof. Orton collected numerous specimens, and Dr. Raimondi sent me two fine ones.

## PECTEN, Brug.

## P. PURPURATUS, Lam.

*Pecten purpuratus*, Lam., Anim. s. Vert. (Desh. Edit.) v. 7, p. 134.

A common Peruvian shell, represented by three specimens in the collection.

## OSTREA, Linn.

## O. GALLUS, Val.

*Ostrea gallus*, Valenc., Voy. Venus, pl. 21, figs. 1 a—d.

Compare *O. cerrosensis*, Gabb, Pal. Cal. v. 2, p. 35, pl. 11, fig. 61.

Two fine specimens imbedded in a gray sandstone, unlike that associated with any others of the specimens.

A few other Tertiary fossils were sent, but they are two imperfect for satisfactory determination, without additional material.

## OBSERVATIONS ON MELANTHO.

BY JAMES LEWIS, M. D.

In the collection of Mr. Chas. M. Wheatley, of Phoenixville, Pa., are many very interesting and valuable specimens illustrating the genus *Melantho* to a very considerable extent. Through the kindness of Mr. Wheatley I have recently been permitted to examine a portion of his collection of *Melantho*, and the result of the examination has been to lead me to a better understanding of a few points that have until now been perplexities and the cause of error.

In conchological investigations, as well as in any other pursuit, progress sometimes requires the investigator to abandon opinions previously received, that others, based on more numerous and significant facts may take their place. The facts and the opinions about to be presented, as having been derived from an examination of a part of Mr. Wheatley's collection, are such as in some instances require the abandonment of opinions previously entertained, while at the same time they help to simplify and systematize the imperfectly understood literature of that portion of American Conchology to which they relate.

A few weeks since, in a letter to Mr. Geo. W. Tryon, Jr., I gave a brief outline of a system of grouping which I had conceived for the genus *Melantho*.

I had regarded *Melantho* as embracing four well characterized groups—as follows :

First. Shell heavy or solid, more or less globular ; opercle gibbous ovate or elongate. Examples : *M. ponderosa*, Say, *M. integra*, Say, *M. regularis*, Lea., *M. obesa*, Lewis.

Second. Shells a little less solid, more elongate, whorls flattened or compressed below the suture, sub-angular on the middle of the last whorl ; opercle gibbous ovate. Examples : *M. coarctata*, Lea, *M. exilis*, Anth., *M. rufa*, Hald., *M. subsolida*, Anth.

Third. Shells of thin texture, whorls usually regularly rounded, suture well impressed, spire regular in its proportions, and,

when perfect, acute. Opercle gibbous ovate. Examples: *M. decisa*, Say, *M. Milesii*, Lea, *M. fecunda*, Lewis, *M. lima*, Anth.

Fourth. A group embracing only *M. De Campii*, Binney.

My examination of Mr. Wheatley's collection destroys the symmetry of this arrangement in some degree, and suggests some new views respecting a few of the species named. Among Mr. Wheatley's shells were a number from the Coosa River, Alabama, which had been labeled by the correspondent from whom he received them *M. coarctata*, Lea. A hurried glance at these shells would suggest only to the observer their apparent identity with the more mature forms usually regarded as *ponderosa*. Two of these specimens, however, on careful examination, revealed a remarkable resemblance to the figure given by Mr. Binney in connection with his quotation of Mr. Lea's description of *coarctata*. They agree also with the description in all essentials, and, so far as is known, are the only shells found in "Alabama" to which Mr. Lea's description and the accompanying figures given by Binney will apply. Various shells found in different portions of the valley of the Mississippi heretofore doubtfully referred to *coarctata* and to *exilis* (Anth.) differ enough from the figure.

We will add to this that Mr. Lea, in citing locality, gives only vaguely "Alabama." The specimen, a single one, was in the collection of Dr. Foreman, whose name at various times appears in connection with species "from the Coosa River," described by Mr. Lea, in such manner as to give countenance to the supposition that *Melantho* (Pal.) *coarctata*, Lea, may have been derived from that prolific stream. All the probabilities of the case point very strongly to the supposition that the true *coarctata* is a young shell from the Coosa River, which, when mature, receives the name *ponderosa*.

All the shells from the Coosa River that are regarded as unquestionable *ponderosa* by collectors, have a peculiar appearance by which persons familiar with them may separate them from similar shells of the rivers of the Ohio system. The young shells of the *ponderosa* of the Ohio system do not, so far as I have any knowledge of them, ape those forms that may be identified with *coarctata*. It is a generally received principle in Natural History that marked differences in the embryos and young of a class of beings are *specific*. If we apply this rule to "*ponderosa*" of the Coosa (referring to the peculiar forms assumed by immature specimens.) it will be a proper inference that those shells are specifically distinct from the *ponderosa* of the Ohio system.

Without assuming, however, to decide any question of difference or of identity between "*ponderosa*" of the Coosa and of the Ohio system of rivers, I shall take it for granted, in the presence of much convincing evidence and in the absence of all evidence to the contrary, that the true "*Pal. coarctata*, Lea," is the young of a species found in the Coosa River, the adult of which is known as *ponderosa*. If this is not a correct inference no one will be more ready than myself to accept convincing testimony in the premises.

Having shown, as I think, in a satisfactory manner what may be regarded as *M. coarctata*, I desire to call attention to other suggestions derived from an examination of Mr. Wheatley's specimens. In his collection are numerous specimens, typical specimens as well as those of a more varied character, illustrating two of Mr. Anthony's species. These specimens, together with others in my own collection, suggest in the most positive manner that *M. exilis* and *M. subsolida* are extreme varieties of one species. In geographical distribution they seem to range through the sluggish side streams of the Mississippi Valley from Iowa to Natchez. How much more extended their distribution may be is not yet known.

So far as the evidence afforded by specimens examined can be relied on, it would seem that the more slender forms known as *exilis* are comparatively more abundant in the southern portion of the area they are known to inhabit.

Specimens sent to me by Mr. John Wolf of Canton, Illinois, gave a large preponderance of the shells regarded as *subsolida*. Mr. W. not being perplexed by any queries about species, made the very natural suggestion that the more slender shells (*exilis*) might be males. But be that as it may, the shells in Mr. Wheatley's collection, as well as in my own, very generally testify that *exilis* and *subsolida* are very uniformly associated. They glide into each other by insensible differences in form and size. Other differences they do not appear to possess—or if any are manifested they are evanescent. The bibliographer may decide which of the two names given to the species—*exilis*, *subsolida*—shall be retained.

*Melantho* (*Pal.*) *lima*, Anth., as represented by the single specimen in Mr. Wheatley's collection, is a well characterized species, which has no decided affinities to group it elsewhere than with *M. DeCampi*.

Mr. Wheatley's collection illustrates some of the local influences which at the South give a geniculate character to *Melantho*, just as in Michigan influences of a local character conspire to impress some species with a clavate, others with a gibbous, form.

There seems to be evidence that, in a variable area extending from the south-eastern angle of North Carolina to the western extremity of West Florida, most of the species of *Melantho* found therein assume that form known as *genicula*, Con. Even *M. rufa*, always readily distinguished by the peculiar color of the interior and by certain appearances in its epidermis, is found in that region having the form of *genicula*! Whether the same local influence reaches westward to the Coosa, modifying the form of the young of "*ponderosa*" by compressing the whorls below the suture, does not seem clear. Associated species should manifest something of this influence in this instance; as in the case of *gibba*, Currier, we find an associate species (quite distinct) assuming a gibbous clavate form. But in the Coosa we have an associated *Melantho* (species undetermined or new) that does not in any degree exhibit the compressed whorls that develop the form of *genicula*. This seems to indicate that the Coosa is not within the area that develops *genicula*.

Among Mr. Wheatley's shells were a number of specimens from Corinth, Miss., that were labelled "*M. coarctata*, Lea." These were thin shells, belonging to a group typified by *decisa* (as found in eastern Pennsylvania). In form these shells are like some of those slender but heavier shells known as *exilis*, but destitute of the subangular character so usually impressed on the last whorl of *exilis*. There are also shells of the same species from Ohio in Mr. Wheatley's collection. The same species from Poland, Ohio, has been distributed by Dr. Kirtland. It is needless to add that this species is not *coarctata*; it is one which, in a careful review of this genus, should have a distinct designation.

Many other suggestions, less conclusive, have been presented in Mr. Wheatley's collection, but as these suggestions are at present merely speculative it is unnecessary to dwell upon them.



ON LINGUAL DENTITION STUDIED BY THE MICROSCOPE  
AND PHOTOGRAPHY.

BY W. G. BINNEY.

With Note by THOMAS BLAND.

## Plate 11.

Through the kindness of Mr. Sam. Powell, I was enabled, during a recent visit to Newport, to study in a most satisfactory way the lingual dentition of many species of terrestrial mollusks. The method adopted by Mr. Powell is to use the microscope together with the photograph. The result is extremely gratifying. The picture obtained fixes forever the character of the dentition and enables us to study it at our leisure. It also removes all the uncertainty of the ordinary figures, for we have the actual photograph instead of a representation of the teeth as they appear to an observer. This latter point is of extreme value now that it has been shown how little reliance can be placed on many of the published figures of lingual dentition.

I do not propose at this time to speak of the method employed in taking the photographs. That is well understood by the microscopist and photographer. My intention is simply to call attention to the subject, and suggest a very satisfactory way of pursuing a very difficult study. I will add, however, that by using the negatives with the magic lantern, a still more valuable method is obtained.

The specimens figured were loaned me by Mr. Bland. Fig. 1 represents a portion of the lingual membrane of *Pupa palanga*, showing one-half of several transverse series of teeth.

Fig. 2 shows the jaw of *Cylindrella rosea*. It will be observed that the edges are in places folded over.

NOTE.—The objects shown in the accompanying figures are extremely interesting, not only in themselves, but as evidence

of the value for purposes of classification, of a knowledge of the lingual dentition of mollusks.

Imperfect acquaintance with the form of the teeth, and assumed absence of a jaw in *Cylindrella*, induced distinguished authors to place that genus in alliance with the vermivorous *Testacellea*. My late discovery, (Amer. Journ. Conch. iv, 186) of the jaw, with a more perfect knowledge of the teeth, negatives such an arrangement. Well, indeed, may Crosse (Journ. de Conch., Jan., 1869, p. 111,) remark, "Voilà donc la classification proposée pour les *Cylindrelles*, par MM. Mörch, Albers, Von Martens, A. Schmidt, etc., totalement coulée à fond!"

*Pupa palanga*, Less., from the form of shell alone, the animal being unknown, has been placed in *Pupa*, but evidently belongs rather to *Ennea*, the teeth of which (*E. bicolor*) are described by Guppy, (Ann. and Mag. N. H., Jan., 1866,) as "slender, somewhat hooked." I found one example of *P. palanga* with the animal, among shells sent to the Brooklyn Historical Society from the Mauritius, by Captain Pike, the United States Consul. The lingual ribbon photographed was obtained by me from that specimen. I did not find a jaw, and from the *Testacella*-like form of teeth believe that none existed.

I may add that I have placed many microscopic preparations of jaws and teeth of *Cylindrella*, teeth of *P. palanga*, &c., at the disposal of my valued correspondent M. Crosse, for publication in the Journal de Conchyliologie.

T. BLAND.

DESCRIPTIONS OF MIOCENE, EOCENE, AND CRETACEOUS  
SHELLS.

BY T. A. CONRAD.

*Miocene Species.*

## PECTINIDÆ.

PECTEN, Linn.

P. CERINUS, Conrad.—Pl. 2, fig. 2.

*Description.*—Subovate, extremely thin, compressed; ears equal; right valve radiately ribbed; ribs very slightly raised and rounded; surface ornamented by minute, close divaricating lines, left valve without ribs.

*Locality.*—St. Charles Co., Md. Prof. Cope.

CALLISTA, Adams, (not Poli).

C. VIRGINIANA, Conrad.—Pl. 2, fig. 1.

*Description.*—Ovate, convex, very inequilateral, substance moderately thick; lunule long, lanceolate, defined by two slight grooves and distinctly carinated line; the inner impressed line minute; these two impressed lines form the raised line which does not rise above the surface of the shell; summit obtuse; posterior side produced, subcuneiform; ventral margin rounded profoundly; posterior extremity obtusely rounded; umbonal slope terminal, suddenly rounded; posterior area depressed opposite the umbo, and inferiorly flattened.

*Locality.*—Petersburg, Va.

## ARCIDÆ.

SCAPHARCA, Gray.

S. TENUICARDO, Conrad.—Pl. 2, fig. 4.

*Description.*—Elongate-ovate, ventricose; ribs about 24 to

the umbonal slope, which is angular; ribs narrow and divided by a longitudinal sulcus, intervening spaces wider than the ribs; posterior area obliquely depressed; ribs about seven in number, flattened and little prominent; posterior end obliquely truncated; hinge area wide, with many closely arranged subangular impressed lines; cardinal plate very narrow, almost linear; teeth small, nearly obsolete.

*Locality*.—Talbot Co., Md. Prof. Cope.

I am indebted to Mr. Gabb for the above species, as well as *Capsa parilis*.

#### SAXICAVA, Bellevue.

S. INSITA, Conrad.

*Description*.—Trapezoidal; posterior hinge margin straight, long and slightly oblique; end margin truncated and slightly oblique, extremity sharply angular; umbonal slope angular.

*Locality*.—Eastern Shore, Maryland. Prof. Cope.

This small smooth species was found in abundance, perforating a fragment of the large *Pecten Jeffersonius*. It has bored entirely through the shell, and the valves may be seen from the small round or oval holes on the interior side of the *Pecten*. Length one-sixth inch.

#### CAPSA, Brug.

C. PARILIS, Conrad.—Pl. 2, fig. 3.

*Description*.—Subtriangular, equilateral, ventricose; right valve irregular on the surface, concentrically rugose-striated; anterior and posterior sides nearly equal in size, rounded on the margins.

*Locality*.—Eastern Shore of Maryland. Prof. Cope.

#### *Eocene Species.*

#### PECTINIDÆ.

#### PECTEN, Linn.

P. KNEISKERNI, Conrad.—Pl. 1, fig. 18.

*Description*.—Ovate, convex, ribs 13, convex, little prominent; anterior and posterior submargins without ribs; ears equal. (Cast).

*Locality*.—Shark River, N. J.

*CRASSATELLIDÆ.*

## CRASSATELLA, Lam.

C. LITTORALIS, Conrad.—Pl. 1, fig. 3.

*Description.*—Subovate, inequilateral, convex, anterior margin regularly rounded; posterior end truncated, direct; ventral margin curved; surface sculptured by numerous impressed lines, obsolete posteriorly; inner margin minutely crenulated. (Cast.)

*Locality.*—Shark River, N. J.

## CRASSINA? Lam.

C. ? VETA, Conrad.—Pl. 1, fig. 5.

*Description.*—Triangular, inequilateral, convex: posterior dorsal margin straight and oblique: anterior extremity angular and situated much above the line of the ventral margin, which is crenulated within; cardinal pit under the apex of the left valve, triangular, wide, oblique. (Cast.)

*Locality.*—Shark River, N. J.

*BUCARDIIDÆ.*

## BUCARDIA.

B. VETA, Conrad.—Pl. 1, fig. 2.

*Description.*—Rounded, inequilateral, profoundly ventricose; summits prominent, rounded; anterior margin obtusely rounded; posterior and ventral margins forming a nearly regular curve.

*Locality.*—Shark River, N. J.

## CARYATIS, Römer.

C. DELAWARENSIS, Gabb.—Pl. 1, fig. 6.

*Description.*—Subovate, ventricose, very inequilateral, umbo and beaks oblique; posterior hinge margin oblique and slightly curved; posterior end obtusely rounded.

*Locality.*—Shark River, N. J.

I referred this cast erroneously to *Cyprina Morrissii*, but fortunately I obtained a mould of the hinge which proves it to be a *Caryatis*.

*CARDIIDÆ.*

## PROTOCARDIA, Beyrich.

P. CURTA, Conrad.—Pl. 1, fig. 1.

*Description*.—Subquadrate, equilateral, ventricose; summits very prominent; umbonal slope angular; posterior slope depressed, margin slightly oblique, subemarginate or straight; ventral margin minutely crenulated. (Cast).

*Locality*.—Shark River.

This genus, common in the Cretaceous strata, is comparatively rare in Eocene and Oligocene, is absent in the Miocene, and only one recent species has been discovered,—*C. Beecheri*—odd valves of which were dredged up from a depth of 40 fathoms, one valve in the Yellow Sea.

## CARDIUM ?

C. — Pl. — fig. 21.

An imperfect cast, with fine ribs and crenulated margin.

*Locality*.—Shark River, N. J.

*ONUSTIDÆ.*

## ONUSTUS, Humph.

O. ANNOSUS, Conrad.—Pl. 1, fig. 4.

*Description*.—Rather elevated; volutions five, rounded, slightly channelled at top, and sculptured with revolving lines, which are obliquely crossed by others, giving the cast a rugoso-tuberculated aspect; lines on the last volution 5 or 6 in number; periphery acute.

*Locality*.—Shark River, N. J.

*TEREBRATULIDÆ.*

## TEREBRATULA.

T. GLOSSA, Conrad.—Pl. 1, fig. 22.

*Description*.—Oblong, sub-ovate, ventricose; biplicated; ventral valve flattened medially and with a nearly straight outline throughout; lateral margins towards the base obliquely truncated; basal margin obtusely rounded.

*Locality*.—N. Jersey.

*Observations*.—This shell is nearly allied to *T. biplicata*, but differs in the nearly straight line of the ventral valve, and in



the oblique area of the foraminal portion of the beak. It is an Eocene species; the former Cretaceous.

*Cretaceous species (Crosswick's group.)*

INOCERAMUS, Sowerby.

I. PECULIARIS, Conrad.—Pl. 1, fig. 13.

*Description*.—Subequilateral; ? convex, posterior margin rectilinear, very oblique, extremity angular; ribs prominent, concentric.

*Locality*.—Crosswicks, N. J.

A single fragment is all I have seen of this peculiar species.

CRASSATELLIDÆ.

CRASSATELLA, Lam.

C. PRORA, Conrad.—Pl. 1, fig. 8.

*Description*.—Triangular, length much greater than the height, subequilateral, slightly ventricose; anterior end regularly rounded, and nearly equal to the posterior, which is truncated; beaks prominent, umbonal slope rounded, undefined; surface marked by concentric furrows (cast).

*Locality*.—Crosswicks, N. J.

VETOCARDIA CRENALIRATA, Conrad.—Pl. 1, fig. 23.

*Astarte corbicula*, Amer. Journ. Conch. vol. iii, p. 12.

*Locality*.—Haddonfield, N. J.

ARCIDÆ.

TRIGONARCA, Conrad.

T. PASSA, Conrad.—Pl. 1, fig. 17.

*Description*.—Subovate, elongated, inequilateral, ventricose, anterior end regularly rounded; umbonal slope sharply angular; posterior slope depressed, concave; surface minutely and obsoletely radiated; beaks distant from the anterior margin: posterior extremity truncated or slightly emarginated.

*Locality*.—Crosswicks, N. J.

GONIOSOMA, Conrad.

An equivalve bivalve with prominent beaks and entire pallial line? the muscular impressions terminal, posterior one round; hinge (in the cast) with two prominent cardinal teeth,

and a long anterior lateral tooth', parallel with the hinge margin above it in the right valve.

G. INFLATA, Conrad.—Pl. 1, fig. 10.

*Description*.—Length slightly more than height; anterior ventral margin subtruncated; beaks very prominent; umbonal slope angular; posterior slope depressed, with a furrow behind the angle of the umbonal slope; posterior margin truncated, direct.

*Locality*.—Crosswicks, N. J.

The anterior end of the lateral tooth is very little above the cicatrix and extends half way across its upper margin.

### NUCULANIDÆ.

NUCULARIA, Conrad.

N. PAPYRIA, Conrad.—Pl. 1, fig. 7.

*Description*.—Shell smooth, oblong-oval, not pearly, thin, anterior hinge margin oblique, teeth angular, end tooth of the posterior line complicated.

*Locality*.—Haddonfield, N. Jersey.

### ARCIDÆ.

AXINEA, Poli.

A. MORTONI, Conrad.—Pl. 1, fig. 14.

Cast, alluded to by Morton, synopsis, p. 64, No. 3.

*Locality*.—Crosswicks, N. Jersey.

### TELLINIDÆ.

CYPRIMERIA, Conrad.

C. SPISSA, Conrad.—Pl. 1, fig. 9.

A cast of a comparatively short, thick, subequilateral species.

*Locality*.—Crosswicks, N. J.

### DENTALIIDÆ.

DENTALIUM, Linn.

D. FALCATUM, Conrad.—Pl. 1, fig. 12, 16.

*Description*.—Falcate, smooth, somewhat expanding towards the base.

*Locality*.—Crosswicks, N. J.

This much curved form is peculiar to the cretaceous formation. There is one other similar species in India—*D. hamatum*.

### NATICIDÆ.

LUNATIA ? Gray.

L. OBTUSIVOLVA, Gabb.—Pl. 1, fig. 11 (*Gyrodes*, Gabb), Proceed. Acad. Nat. Sc. 1861, p. 321.

### CANCELLARIIDÆ.

TURBINOPSIS Conrad.

T. DEPRESSA, Gabb.—Proceed. Acad. Nat. Sc. 1861, p. 321.

*Locality*.—Crosswicks, N. Jersey.

### CERITHIIDÆ ?

Pl. 1, fig. 15.

This cast cannot be referred to any known genus, unless to *Torcula*.

### VOLUTIDÆ.

Pl. 1, fig. 20.

A common form in the lower beds, too imperfect to characterize.

*Locality*.—N. Jersey.

My apology for publishing the above casts of shells is that they characterize the lower beds of the eastern Cretaceous, in which I believe no shell has yet been found with the substance preserved.

OBSERVATIONS ON THE GENUS *ASTARTE*, WITH  
DESCRIPTIONS OF THREE OTHER GENERA OF CRAS-  
SATELLIDÆ.

BY T. A. CONRAD.

Sowerby described his genus *Astarte* from Oolitic shells of which he had specimens not well representing the hinge character. In a collection of shells from the Great Oolite, presented to the Academy by Dr. Wilson, are specimens labelled in England, of *A. elegans*, *A. lurida* and others, in which the hinge character is well exhibited. I propose to give a new diagnosis of the genus, and to figure the hinges of *A. lurida* and *A. elegans*, which prove the genus to be distinct from *Crassina*, Lam. *Astarte*, as thus defined, became extinct at the close of the Lower Green Sand epoch, at least so far as our knowledge of the cardinal character of simulating forms extends. The hinges of the species figured by Pictet and Roux, from the "Gres Vert," near Geneva, are not figured or described, and therefore the shells are but conjectural members of *Astarte*.

ASTARTE, Sowerby.

*Hinge character.* Cardinal plate broad; cardinal teeth two in each valve; anterior cardinal margin raised into a distinct lateral tooth as long as the lunule in the right valve, which fits into a corresponding furrow on the opposite valve; posterior lateral tooth or elevated margin in the right valve elongated; furrow in the opposite valve broad, resembling that of *Unio*.

*A. LURIDA*, Sowerby.—Pl. 9, fig. 2.

*A. ELEGANS*, Sowerby.—Pl. 9, fig. 13.

In the Chalk period and its equivalents no hinge has been described or figured answering to the typical *Astarte*, but there are intermediate forms between *Crassatella* and *Astarte* which make a complete chain of genera in the family.

LIRODISCUS, Conrad.

Equivalve; disk concentrically ribbed; posterior side lobed by an impressed line; hinge with two cardinal teeth in each valve; right valve with a small pyramidal lateral tooth near the anterior cicatrix; left valve with the same posteriorly and distant

from the cardinal teeth; posterior hinge plate broad and entire in the left valve.

It is probable that the Cretaceous *A. sinuata*, d'Orbigny, is a species of this genus, as the external character is very similar.

ASTARTE TELLINOIDES, Conrad. Eocene.

A peculiarity of *L. tellinoides* is that the broad flat surface of the posterior cardinal tooth is rugoso-striate transversely.

This genus is a link between *Crassatella* and *Astarte*.

RADIOCONCHA, Conrad.

Compressed, inequilateral, radiated; hinge without a distinct cardinal pit.

CRASSATELLA GUERANGERI, d'Orbigny.

C. ROBINALDINA, d'Orbigny.

This genus, though nearly allied to *Crassatella*, is sufficiently distinct in hinge and sculpture. It existed only in the Cretaceous period.

PACHYTHÆRUS, Conrad.

This genus of fossil shells is closely allied to *Crassatella*. The pit behind the cardinal tooth of the right valve is generally much wider than in *Crassatella*, and there is a small pit behind the posterior cardinal tooth of the left valve not seen in *Crassatella*, while the inner margin of all the species is densely though finely crenulated. This character marks every species down to the Eocene, inclusive. In the Miocene species the margin is entire, and generally so in the recent, although two or three have subtuberculiform, much larger crenulations than any of the fossils. This difference in character between the fossil and recent species is very obvious, and in the Cretaceous species the comparatively smaller cartilage pit and the large triangular pit under it give the hinge a very different aspect from that of the Miocene and recent species of *Crassatella*; but in the elongated Eocene forms this character is less obvious, and is nearly the same as in the living genus *Crassatella*. Type, *Crassatella I'ndiemensis*, d'Orbigny.

According to the above generic character the genus *Crassatella* originated in the Miocene Period.

CRASSATELLA PTEROPSIS, Gabb, not Conrad.

Mr. Gabb described this species in Part iv, 2d series of Journ. Acad. Nat. Sc. by the same name as a species I described in the same No. Both are from the Ripley Group, Mr. Gabb's species from Tennessee and Alabama. I think Mr. Gabb's shell is the young of *pteropsis*, Conrad. I found it at Haddonfield, of a

much smaller size than the Mississippi specimen, and a great deal shorter in proportion.

#### SCAMBULA, Conrad.

Hinge with two approximate teeth in the right valve, the posterior one direct and ending at the apex; a long anterior double tooth parallel with the straight cardinal line; anterior muscular impression small, rounded.

S. PERPLANA.—Pl. 9, figs. 7, 8.

*Description*.—Elongated, triangular, flat; disk uneven, faintly striated concentrically; a few prominent, fine concentric ribs on the umbo; anterior margin obliquely truncated; posterior dorsal margin concave; apex acute, perfectly erect.

*Locality*.—Haddonfield, N. J.

This singular shell is perfectly flat on the disk, so that the space for the animal was exceedingly small. The ventral margin is carinated anteriorly, and the inner surface of the valves is granulated.

#### GOULDIA.

G. DECEMNARIA.—Pl. 9, fig. 4.

*Description*.—Minute, inequilateral, convex, with about 12 concentric prominent ribs.

*Locality*.—Haddonfield, N. J.

G. DECLIVIS.—Pl. 9, fig. 5.

*Description*.—Minute, triangular, compressed, equilateral, summit acute; posterior extremity angular; disk with numerous very regular, close concentric lines.

*Locality*.—Haddonfield, N. J.

#### VETOCARDIA, Conrad.

Trapezoidal or subtriangular, costate; hinge character—one thick pyramidal tooth under the apex of the right valve, either direct or pointing obliquely backwards, a pit on each side; left valve—one long very oblique tooth, directed backwards, and a pit anterior to it.

A small species of this genus in the Ripley Cretaceous, near Haddonfield, New Jersey, has enabled me to obtain a perfect hinge of both valves. The valves in this genus are sculptured with radiating or concentric ribs, and none have been found as much as one inch in length. The genus is known only in Cretaceous strata, and is easily recognized by external form and sculpture.

V. CRENALIRATA, Conrad, (*Astarte*), Jour. A. N. S. 2d series, vol. iv, pl. 46, fig. 22.

*V. corbicula*? Conrad.



# NOTICES AND REVIEWS

## OF

# NEW CONCHOLOGICAL WORKS.

BY GEO. W. TRYON, JR.

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### I.—AMERICAN.

**Museum Arangianum.** Catalogue of the extra-Cuban species of Mollusks in the Collection of D. Rafael Arango. 8vo. Havana, Cuba, Dec. 1868. 20 pp.

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**The Canadian Journal of Science, Literature and Arts.** XII. No. 1. Toronto, 1868.

*Molluscos Animals.* No. 3. By REV. PROF. HINCKS.

In this paper the author commences to review the classification of the Gasteropoda.

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**Geological Survey of Illinois.** A. H. WORTHEN, Director. Vol. 3. Geology (by A. H. WORTHEN), and Palæontology (by F. B. MEEK and A. H. WORTHEN). 4to. Springfield, Ills. 1868.

We do not consider ourselves competent to review the geological part of this work, and it is out of our province to do so; we therefore leave this duty to others who are better qualified.

A somewhat hasty examination of the palæontological portion of the report enables us to allude to it only on terms of unqualified praise. Whatever Mr. Meek undertakes in this line is sure to be done carefully and accurately.

Most of the descriptions of new species have been published within the past few years in the Philadelphia and Chicago Academies' Proceedings. The illustrations from drawings by Mr. Meek are numerous and generally excellently engraved on steel. The volume is in every respect a credit to its authors, engravers, printers, and to the enlightened public sentiment which has prompted its preparation and publication at the expense of the State.

Proceedings Boston Society of Natural History. Pp. 145—160. 1868

Prof. Bickmore exhibited a specimen of *Nautilus pompilius* in alcohol, collected by him at Amboina, which is the only specimen ever brought to this country. It has been commonly believed that the Nautilus occasionally rises to and swims on the surface of the water, but after repeated inquiries of the natives, Prof. B. became satisfied that the animal never rises from the bed of the sea. The Malays collect them for food.

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Annals of the Lyceum of Natural History. IX. Nos. 1—4. New York. 1868.

*Notes on certain Terrestrial Mollusca*, with description of new species. By THOMAS BLAND.

This paper details the interesting discovery of the presence of a jaw in the animal of various species of Cyliindrellidæ, so that Crosse's genus *Eucalodium*, originally separated from the family on account of the presence of the jaw, must now revert to it again.

Prof. Gabb's *Cyl. Newcombiana*, published in this Journal iii, 237, t. 16, f. 3—4, belongs to the genus *Eucalodium*, which will embrace the large Mexican species. Gabb's name, however, is a synonym, as the same species was described by Pfeiffer, Proc. Zool. Soc., 1861, 27, t. 2, f. 7, as *Clausilia (Balea ?) Taylora*.

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Descriptions of Twelve New Species of Unionidæ from South America, &c., &c. By ISAAC LEA, L.L.D. 8vo., 32 pp. Phila. 1868.

This paper contains reprints of all of Mr. Lea's papers, (14 in number), published in the Proceedings of the Academy of Natural Sciences of Philadelphia, from March 1866 to June 1868.

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## II.—FOREIGN.

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### ENGLISH.

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Journal of the Linnean Society. Zoology. Vol. 10. No. 38. London. 1868.

*On the Anatomy and Physiology of the Tunicata.* By ALBANY HANCOCK, F.L.S.

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Annals and Magazine of Natural History. 4th Series. Vol. 2. No. 8. London. Aug., 1868.

*On Spirifer cuspidatus.* By Dr. W. B. CARPENTER.

*On Oliva auricularia*, Lam., *O. aquatilis*, Reeve, and *O. auricularia*, D'Orb. By F. P. MARRAT.

The author endeavors to unravel the snarl into which these species had become involved. He believes that the second is a synonym of the first, and that D'Orbigny's species, being distinct, not only from the true *auricularia* with which it was confounded by D'Orbigny, but also from *biplicata*, Sowb., with which it has been more recently confounded, should receive the name of its discoverer, *D'Orbignyi*. Lamarck's species is African, the other South American.

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No. 9. September, 1868.

*On a point relating to the Histology of Rhynchonella.* By PROF. W. KING.

*On some new species of Oliva.* By F. P. MARRAT.

*O. lignaria*, Borneo.

*O. notata*, Loc.—?

*O. sabulosa*, Loc.—?

*O. exilis*, South America.

*O. angustata*, China.

*O. pulchra*, Loc.—?

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No. 10. October, 1868.

*On the typical value of the Lingual Dentition in the right distribution of the genera of Gasteropoda into Natural Groups and Families.* By JOHN D. MACDONALD, M.D.

This is an attempt to show that dentition is a sure guide in classification, *provided* only those species are included, in families where the type of dentition is identical—and that, per contra, the discredit that has been cast on this method of classification originated in the fact that Conchologists have persisted in grouping together genera and species in which the dentition is totally distinct. Dr. Macdonald is right in both premises, but we think that his paper will not answer the purpose for which it was designed, for the lists of two families arranged by dentition will be sufficient of themselves to demonstrate to all Conchologists the impropriety of uniting in one family mollusca so very dissimilar, merely because they are alike in one character.

*On the structure of the Shells of Brachiopoda.* By DR. WM. B. CARPENTER.

*Last Report on Dredging among the Shetland Islands.* By J. GWYN JEFFREYS.

This paper contains a valuable list of seventy-five species of Mollusca, usually considered northern, which are common to the North Sea and the Mediterranean, with their principal synonyms;

in which a large number of species are reduced to the rank of synonyms.

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No. 11. Nov., 1868.

*Remarks upon Mr. J. Gwyn Jeffreys' last Dredging Report.* By R. MACANDREW.

*On the species of Cæcidæ, Corbulidæ, Volutidæ, Cancellariidæ, and Patellidæ, found in Japan.* By ARTHUR ADAMS.

*Note on Dr. Macdonald's paper on the Dentition of Gastropods.* By DR. J. E. GRAY.

"I think that Dr. Macdonald has committed an error that is common to young naturalists—has mistaken an analogy for an affinity. The form of the lateral teeth of the odontophore is, no doubt, a good specific (?) (and may be generic) character, but I think that Dr. Macdonald's table proves that it is not the character of a family. The character of a family should be derived from the consideration of the whole animal—its form, the form and development of the teeth, and the form of the shell and operculum; and not from any one character, such as the form of the lateral lingual teeth, especially if it brings together in one family such a series of incongruous genera and separates nearly allied genera as they are separated in Dr. Macdonald's list. Therefore, I cannot agree with him that "the lingual dentition appears to be the only appeal," or that the best means for arranging the genera and families is according to the form of the lateral teeth. I think if any one will consult Dr. Macdonald's plate, he must perceive that the lateral teeth gradually pass from one form to the other; and I cannot conceive any reason why all the forms figured may not belong to the genera of one family."

*Note on Pompholyx, Lea, a new family of Fluvatile Mollusca.* By DR. J. E. GRAY.

This article appears to have been written very hastily—so much so, in fact, as to make one incredulous as to whether the writer really *read* understandingly the paper by Mr. Dall, published in the California Proceedings, on which his note is founded. In the first place I object to Dr. Gray's title; he has not used the family termination of *idæ*. Secondly, Mr. Dall did *not* propose a new family but a sub-family name. I wonder that Dr. Gray should make such mistakes, especially as he proceeds to quote Mr. Dall's name Pompholinæ, which *has* the proper sub-family termination. "The existence of the second pair of eyes

is an anomaly in terrestrial mollusca, and requires confirmation." Who said that *Pompholyx* was a terrestrial mollusk? It is fluviatile. Prof. Gabb assures me that the animal has two pairs of eyes, as described, but I think with Dr. Gray that black spots have been mistaken for eyes. I object also to the word "fluviatile" being applied to *Auriculadæ*, and would remark that if Dr. Gray had seen the shell of the animal he criticizes he would never have suspected it to belong to the *Auriculadæ*. Except in the matter of eyes, the animal appears to be a true Lymnæan, both by general appearance, habitat and shell.

*Dredging among the Shetland Isles. Note.* By J. GWYN JEFFREYS.

*On the Jaw of Cyllindrella.* By T. BLAND, (in a letter to Dr. J. E. Gray.)

This announcement is identical, as to facts, with the recent paper with figures published by Mr. Bland in this Journal.

**Proceedings Zoological Society.** London. 1868. Part 1.

*Further descriptions of new species of Shells collected at Mauritius by Geoffrey Nevill, Esq.* By HENRY ADAMS.

<i>Stomatia variegata,</i>	<i>Gibbus Barclayi,</i>
<i>Discus vorticella,</i>	" <i>productus.</i>
<i>Nanina cernica,</i>	<i>Thyreopsis</i> n. g. ( <i>Galeommidae</i> .)
<i>Pupa exigua,</i>	" <i>coralliophila.</i>
<i>Gibbus Mondraini.</i>	

*Descriptions of some new species of Land and Marine Shells.*  
By HENRY ADAMS.

*Macrochlamys tenuicula,* Bombay.  
*Glessula fusca,* "  
*Vitrina Angasi,* Capengo, W. Africa.  
*Nanina sulcifera,* Barelay MSS. Mauritius.  
*Gibbus clavulus,* Mauritius.  
*Palaina Coxi,* Norfolk Isld.  
*Diplommantina minuta,* Hab.—?  
*Pelopia* (n. g. *Anatinidae*) *brevifrons,* Hab.—?

*Description of six new species of Shells.* By EDWARD THOMAS HIGGINS.

*Cypræa castanea,* South-east Africa. *Helix Farrisi,* Peru.  
*Bulimus rubrovariegatus,* Peru. *Mycetopus falcatus,* Brazil.  
 " *lamas,* Peru.  
*Nanina DeCrespignii,* Labnon.

Proceedings of the Zoological Society of London. Part 2. London. 1868.

*Description of a new species of Helix from South Australia.*

By GEORGE FRENCH ANGAS.

*Helix Silveri*, South America.

*Notes on some of the species of Land Mollusca inhabiting Mauritius and the Seychelles.* By GEOFFREY NEVILL.

*Description of some new species of Shells collected by Geoffrey Nevill, Esq., at Mauritius, the Isle of Bourbon, and the Seychelles.* By HENRY ADAMS.

<i>Conus Bourbonicus,</i>	<i>Vertigo Borbonica,</i>
<i>Nevillia (N. G. Rissoidæ,</i>	<i>Gibbus Deshayesii,</i>
“ <i>picta,</i>	“ <i>Moreleti,</i>
“ <i>lucida,</i>	“ <i>cylindrellus,</i>
<i>Stylifer speciosus,</i>	<i>Ennea Nevilli,</i>
<i>Nanina Geoffreyi,</i>	<i>Cyathopoma Blanfordi,</i>
<i>Discus serratus,</i>	<i>Omphalotropis Borbonica,</i>
<i>Acicula Mauritanica,</i>	<i>Scrobicularia (Capsa) rostrata.</i>

*Descriptions of some new species of Shells, chiefly from Ceylon.*

By HENRY ADAMS.

<i>Plicifer (N. G. Styliferidæ),</i>	<i>Corbula (Azara) rostrata.</i>
“ <i>Nevilli,</i>	<i>Nanina Poweri,</i>
<i>Cyclostrema Nevilli,</i>	<i>Cyclophorus Layardi.</i>
“ <i>subdisjuncta.</i>	

*A review of the species of the Genera Melo and Cymba of Broderip.* By T. G. PONTON.

The author believes *M. ducalis*, *M. umbilicata*, *M. Georginia* and *M. diadema*, to be identical. He also believes *C. porcina* of Lamarck to be the same as *C. proboscidalis* and *C. patula*, Brod., the young of *C. Neptuni*.

A few years since, when arranging the specimens in the Museums of the Academy of Natural Sciences, I arrived at the same conclusions, except as to the last, (*patula*) of which we had no specimen.

**Conchologia Iconica.** Parts 274, 275. 4to. London. 1868.

UNIO.—Plates 85 to 93. Sept., 1868.

The great improvement in identification of the species noticed in our last review of this monograph still continues. The color of the epidermis of *Monocondylæa rhomboidea* is too light in the



plate, unless it is intended to represent a badly worn specimen. *Unio folliculatus* is not by any means allied to *Shepardianus*, but belongs to a group the typical species of which is *U. Fish-erianus*.

TELLINA.—Plate 45. Sept., 1868.

- |                         |          |              |
|-------------------------|----------|--------------|
| <i>T. elevata</i> ,     | Sowerby. | West Indies. |
| " <i>cuneolus</i> ,     | "        | Coromandel.  |
| " <i>armata</i> ,       | "        | Hab.—?       |
| " <i>aquistriata</i> ,  | "        | "            |
| " <i>striatissima</i> , | "        | "            |

GALATEA.—Six plates (complete). Sept., 1868.

- |                         |          |        |
|-------------------------|----------|--------|
| <i>G. biangulata</i> ,  | Sowerby. | Hab.—? |
| " <i>triangularis</i> , | "        | "      |

Conchologia Iconica. Parts 276, 277. London. 1868.

UNIO.—Plates 94, 96 and 1. Completing the genus.

- |                    |         |             |
|--------------------|---------|-------------|
| <i>U. scutum</i> , | Benson. | Tenasserim. |
| " <i>parma</i> ,   | "       | "           |

Mr. Sowerby says of *U. Churchillleanus*, Bourg., "Almost a *Monocondylæa*"—Quite: belongs to the same group as *M. rhomboidea*.

This monograph is now completed—with 325 species, a number smaller than those indigenous to North America alone.

AKERIA—1 plate.

DOLABELLA.—2 plates.

- |                      |        |             |
|----------------------|--------|-------------|
| <i>D. elongata</i> , | Sowb., | Seychelles. |
|----------------------|--------|-------------|

DOLABRIFERA.—1 plate.

- |                    |        |             |
|--------------------|--------|-------------|
| <i>D. vitrea</i> , | Sowb., | Fiji Isles. |
|--------------------|--------|-------------|

TELLINA.—Plates 46—54.

- |                           |          |                  |
|---------------------------|----------|------------------|
| <i>T. producta</i> ,      | Sowb.    | Hong Kong.       |
| " <i>Myæformis</i> ,      | Sowerby. | Coromandel.      |
| " <i>obtusa</i> ,         | "        | Ins. St. Thomas. |
| " <i>Belcheri</i> ,       | "        | Hab.—?           |
| " <i>ensiformis</i> ,     | "        | Australia.       |
| " <i>glabrella</i> ,      | Desh.    | Hab.—?           |
| " <i>Fijiensis</i> ,      | Sowerby. | Fiji Isles.      |
| " <i>crebrimaculata</i> , | "        | " "              |
| " <i>plena</i> ,          | "        | Hab.—?           |
| " <i>immaculata</i> ,     | Phil.    | Sandwich Isles.  |
| " <i>Mactræformis</i> ,   | Sowb.    | Australia.       |
| " <i>succinea</i> ,       | "        | Manilla.         |

**Catalogue of the Mollusca in the Collection of the Government Central Museum, Madras.** By Capt. J. MITCHELL, Superintendent. 8 vo., 78 pp. Madras. 1867.

This Catalogue is published for the triple purpose of "affording a guide to the collection; of making known its deficiencies (which are many); and to show what the Museum has to offer in exchange for shells not yet in the collection. The number of species enumerated is about two thousand. In consequence probably of careless proof-reading, a large proportion of the names are mis-spelled.

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FRENCH.

**Revue et Magasin de Zoologie.** Paris. Oct., 1868.

*Mollusques nouveaux, litigieux ou peu connus.* By M. BOURGUIGNAT. (Continued).

<i>Zonites Issericus,</i>	Letourneux.	Algiers.
<i>Helix Faidherbiana,</i>	Bourguignat.	"
" <i>Djebbarica,</i>	"	"
" <i>Tlemcenensis,</i>	"	"
<i>Ferussacia Oranensis,</i>	"	"
" <i>diodonta,</i>	"	"
<i>Clausilia Davidiana,</i>	"	Syria.
" <i>prophetarum,</i>	"	"

To this paper is adjoined a synonymical list of the Syrian Clausiliæ.

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No. 11. Paris. 1868.

*Mollusques nouveaux, litigieux ou peu connus.* By M. J. R. BOURGUIGNAT.

<i>Clausilia Gaudryi,</i>	Beyrut.
" <i>Bargesi,</i>	"
" <i>Judaica,</i>	"
" <i>Dutailliana,</i>	"
" <i>Phœniciaca,</i>	"
" <i>sancta,</i>	"
" <i>Hierosolymitana,</i>	Jerusalem.
<i>Pomatias atlanticus,</i>	Letourneux. Kabylia.
<i>Melanopsis Penchinati,</i>	Bourg. Aragon, Spain.

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**Erpetologie Malacologie et Paleontologie des Environs du Mont-Blanc.** By M. VENANCE PAYOT. 8 vo., 68 pp. Lyons. 1864.

Not quite one-half of this work is occupied with a list (with

synonyms and localities) of the Mollusca. The most interesting facts are those regarding the altitudes at which the species are found.

**Journal de Conchyliologie.** 3d Ser., IX., No. 1. Paris. January, 1869.  
(112 pp. of text and three plates.)

*Catalogue des Nudibranches et Céphalopodes des côtes océaniques de la France.* (1st Supplement.) By P. FISCHER.

*Eolis grossularia.*

*Eolis conspersa.*

*Note sur une nouvelle espèce de Sepia des côtes de France.*  
By A. LAFORT.

*Sepia Filliouxii.*

*Note sur quelques Coquilles de la Nouvelle-Calédonie, et Description d'espèces nouvelles.* By E. MARIE.

*Cypræa Crossei.*

*Cypræa Noumeensis.*

*Descriptions de deux nouvelles espèces d'Helix d'Espagne.*  
By DR. J. G. HIDALGO.

*Helix Ebusitana.*

*Helix Boscæ.*

*Note sur le Melaniella Pichardi et l'Helicina Nodæ, Arango.*  
By H. CROSSE.

*Description d'espèces inédites provenant de la Nouvelle-Calédonie.* By H. CROSSE.

*Hydrocena Caledonica.*

*Helicina Lifouana.*

*Helix Ferrieziana.*

*Diagnosis Molluscorum novorum Guatemalæ et Reipublicæ Mexicane.* By H. CROSSE and P. FISCHER.

Genus *Streptostyla*, (from *Spiraxis*.)

*S. Binneyana,*

*S. Sololensis,*

" *Edwardsiana,*

" *cornea,*

" *Sallei,*

" *Bocourti,*

" *cingulata,*

" *Glandiniiformis,*

" *Blandiana,*

Genus *Petenia*, type,

" *Boyeriana,*

*Glandina ligulata*, Morel.

" *fulvida,*

*Catalogue des Cypræa de la Nouvelle-Calédonie et Description d'espèces nouvelles.* By H. CROSSE.

*C. Caledonica.*

*C. Bregeriana.*

*Description d'un Bulimus nouveau de la republique de l'Equateur.* By J. G. HIDALGO.

*Bul. visendus.*

*Description de deux Hélices nouvelles de Corse.* By H. CROSSE and O. DEBEAUX.

*H. insularis.*

*H. Cenestinensis.*

*Description de quelques nouvelles espèces terrestres de divers points de l'océan Pacifique et de l'Australie.* By ALBERT MOUSSON.

*Zonites Strangei*, Australia.

*Patula biretracta*, “

*Helix Pelewana*, Ins. Pelew.

“ *informis*, Australia.

*Bulimus Ouveanus*, Dotzauer. Ins. Ouvea.

*Bul. palmarum*, N. Hebrides.

*Laimodonta Anaaensis*, Paumotus.

*Ophicardelus irregularis*, Wollongong.

“ *minor*, “

*Helicina Anaaensis*, Paumotus.

*Hydrocena Raiatecensis*, Ins. Society.

*Truncatella arctecostata*, Paumotus.

*Diagnoses Molluscorum novorum.* By H. CROSSE.

*Bul. Souvillei*, Morelet. New Caledonia.

*Melanopsis Mariei*, Crosse. “

“ *Dumbeensis*, “

*Description d'espèces inédites de la Nouvelle-Caledonie.* By J. B. GASSIES.

*Helix Lalannei*,

*Auricula Hanleyana*,

*Bulimus senilis*,

“ *Gundlachi*,

“ *Guestieri*,

*Physa Artensis*,

“ *Lamberti*,

*Melanopsis elegans*,

*Pupa condita*,

“ *lirata*,

*Melampus obtusus*,

*Hydrocena Crosseana*,

“ *crassidens*,

“ *Hidalgoi*,

“ *granum*,

*Truncatella diaphana*.

*Auricula Binneyana*,

*Description de nouveaux Brachiopodes du terrain tertiaire du sud-est de la France.* By P. FISCHER.

*Descriptions de Coquilles Fossiles des terrains tertiaires supérieurs.* (Continued.) By C. MAYER.

*Description du nouveau genre Pyrgidium et de deux espèces fossiles des terrains d'eau douce du département de la Côte-d'Or.* By M. R. Tournouer.

*Bibliographie.*

*Neerologie.*

*Nouvelles.*

#### GERMAN.

**Novitates Conchologicæ.** Supplement III. Nos. 12 and 13. (Monograph of *Venus*, L., with six colored plates.)

The present issue is occupied by an account of the species of *Dione*, by Dr. Edward Römer.

**Martini and Chemnitz's Systematisches Conchylien-Cabinet.** Continued by H. C. Küster. 187th Part. 4to. 6 colored plates. Nürnberg. 1868.

This work is also now occupied with the *Veneridæ*.

**Monographia Heliceorum viventium.** By Dr. Louis Pfeiffer. Vol. V. (Third Supplement. Vol. 1.) 565 pp. 8vo. Leipzig. 1868.

This volume gives the additional species and synonymy that have accumulated since the date of the 4th volume, 1859. The same style of treating the subject and the same artificial classification is continued, as in the previous monographs. The present publication contains the species principally of *Helix*, of which the numbers amount to 2833 species, being an increase of 735 species since 1859, notwithstanding since-discovered synonyms.

It would be a work of supererogation to write a laudatory notice of such a work as Pfeiffer's. Its best recommendation is that no Conchologist can undertake to study terrestrial shells without it.

**Nachrichtsblatt der deutschen Malakozoologischen Gesellschaft.** Nos. 1 and 2. Dec., 1868. No. 3. Jan., 1869.

This is a 16-page sheet, issued by a new association intended to encourage and advance the interests of Malacology among the Germans and others. It is a vehicle of communication and a receptacle for stray facts and opinions. It is a sort of Conchological "Notes and Queries,"—and as such will doubtless become of value. There is as yet no attempt to describe new species or genera, and we do not know whether or not such papers are contemplated as a feature of the Magazine.

**Novitates Conchologicæ. Suppl. 3. Monographie der Molluskengattung Venus, Linne.** By DR. EDW. RÖMER. 14th, 15th Parts, with 6 colored plates. 4to. Cassel, 1869.

The present issue contains the species (21) of *Lioconcha*, Mörch, which is treated as a section of *Cytherea*.

The text is evidently worked out with great care, and the illustrations are remarkably fine specimens of the art of chromolithography.

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**Systematisches Conchylien-Cabinet von Martini und Chemnitz.** Continued by H. C. KÜSTER, etc. 188th and 189th Parts. Nürnberg. 1868.

The 188th Part commences with a Monograph of *Cardiidae*, by Dr. E. Römer. *C. costatum* is the type of a new section—*Tropidocardium*, Römer, and *C. aculeatum* of another section—*Acanthocardium*, Römer. In *Isocardia*, *I. cor* is the type of *Tychocardia*. There is also a continuation of the monograph of *Cytherea*.

Part 189 continues the *Muricidae* and *Purpuridae*, and contains Monographs of *Argonauta*, *Nautilus*, *Spirula*, *Ianthina* and *Recluzia*, by the editor.



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# AMERICAN JOURNAL OF CONCHOLOGY.

NEW SERIES.

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CONCHOLOGICAL SECTION of the Academy of Natural Sciences of Philadelphia

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VOL. V.

1869-70.

PART 2.

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*Meeting April 1st, 1869.*

Eight members present.

DR. W. S. W. RUSCHENBERGER, Director, in the Chair.

Donations to the Museum and Library were read.

The following papers were offered for publication and referred to Committees:—

“Descriptions of new species of Marine Gasteropoda, inhabiting Polynesia;” by Wm. Harper Pease.

“Remarks on Marine Gasteropoda inhabiting the West Coast of America, with descriptions of two new species;” by Wm. Harper Pease.

“Corrections and Additions to the synonymy of Marine Gasteropoda inhabiting Polynesia;” by Wm. Harper Pease.

“Notes upon the Monograph of the genus *Marginella* in Reeve's *Conchologia Iconica*;” by John H. Redfield.

“Catalogues of the Families Porcellanidæ and Amphiperasidæ;” by S. R. Roberts.

Mr. Tryon announced that our fellow-member, Mr. Wm. M. Gabb, was making collections for the Section in the Island of San Domingo.

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*Meeting May 6th, 1869.*

Eight members present.

DR. W. S. W. RUSCHENBERGER, Director, in the Chair.

A number of additions to the Museum and Library were reported.

The following papers were offered for publication and referred to Committees:—

“Descriptions of New Cretaceous Mollusca;” by T. A. Conrad.

“Notes on Recent Mollusca;” by T. A. Conrad.

Mr. Conrad remarked that during the period that the immense Saurians lived whose remains are found in New Jersey, the shells were very fragile, indicating that the waters were still. The shells of the same period from Mississippi are alike fragile.

Mr. Albany Hancock, of New-castle-upon-Tyne, England, and Dr. Edward Römer, of Marberg, Hesse, were elected correspondents of the Section.

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*Meeting June 3d, 1869.*

Six members present.

DR. W. S. W. RUSCHENBERGER, Director, in the Chair.

Donations to the Museum and Library were read.

The following papers were read by title and referred to Committees:—

“Descriptions of new species of Terrestrial Mollusca from the Andaman Islands, Indian Archipelago;” by George W. Tryon, Jr.

“Notices and Review of New Conchological Works;” by Geo. W. Tryon, Jr.

The death of Mr. Frederic Cailliaud, of Nantes, late an active Correspondent of the Section, was announced.

Mr. Tryon exhibited a valve of *Pecten irradians*, Lam., on which were growing specimens of *Crepidula unguiformis*. The specimen was interesting on account of a recent assertion made by Dr. J. E. Gray, in the London Zoological Proceedings,

that the species was only a synonym of *C. fornicata*, and owed its supposed distinctive characters to its habitation *within* univalve mollusca. The specimens now shown are true *unguiformis*, and are growing on the external surface of the Pecten.

Mr. Tryon exhibited specimens of *Mercenaria præparca*, Say, and remarked that *M. Mortoni*, Conrad, and *M. fulgurans*, Tryon, had both proved to be synonyms of it, the latter being the young shell.

Mr. Wm. H. Dall was elected a Correspondent, and Mr. Charles Wilson Peale a member of the Section.

DESCRIPTIONS OF NEW SPECIES OF MARINE GASTERO-  
PODÆ INHABITING POLYNESIA.

BY WM. HARPER PEASE.

## TEREBRA.

Thirty-two species of the above genus are known to me as inhabiting the Hawaiian Islands, sixteen of which have not been found elsewhere. Having made lately a critical examination of all specimens collected by me, I am able to add nine species to those previously described.

I discover that the synonymy of *T. Peasii*, Desh., as published by me, was incorrect. I was led into the error by following the name attached to the typical specimens forwarded me. That species is without doubt a synonym of *T. puncticulata*, Desh., and the species mistaken for it is a variety of *T. Swainsonii*, Desh., departing so widely from the type that I distinguish it by a distinct name, as follows :

*T. Swainsonii*, Desh., var. *inflexa*, Pease.

The ribs on the type are straight, and interstices, especially on the upper whorls, faintly and remotely striate transversely.

The ribs on the above variety are flexuous, interstices impressly striate or grooved throughout, and whorls shorter. The shell is usually longer. The figure and description of *T. Swainsonii* in Conch. Icon., are taken from a specimen of the above variety.

*T. SCULPTILIS*, Pease.

*T. elongato-turrita*, gracilis; anfr. 15, superne costa, nodosa, conspicua, cingulatis, utrinque sulco marginata; anfractibus concavo-excavatis, longitudinaliter arcuato-striatis, superne juxta sulcum nodoso-crenulatis; apertura parva, oblonga, columella contorto-recurva; costa alba, interstitiis pallide straminea.

Long. 25. Diam. 4 mill.

*Hab.* Insl. Oahu.

Shell elongate turritid, slender; whorls 15, encircled round the upper part by a conspicuous nodose rib, which is bordered on either side by a groove, whorls between, concave, finely arcuate, striate longitudinally and nodosely crenulate above, next the groove. Color of rib white, remaining portion of the whorls pale straw color.

Closely allied to *T. nebulosa*, Lorois, Jour. de Con. 1858, p. 90, pl. 1, f. 4.

As that name is preoccupied, both by Sowerby and Keiner, the above will take its place, should it prove to be the same species.

#### *T. SUFFUSA*, Pease.

*T. subulata*, pallide carneo suffusa; anfractibus, fere planis, subconvexiusculis, transversim obsolete tenuiter striata, sulco pertuso superne divisis; sutura subacuta, lacerata; apertura oblongo-ovata, subeffusa; columella subrecta, laminata.

Long. 30. Diam. 9 mill.

*Hab.* Insl. Oahu.

Shell subulate, suffused with pale flesh color; whorls nearly flat, very slightly convex, transversely obscurely finely striate, divided at the upper part by a pricked groove; suture somewhat acute, ragged within; aperture oblong ovate, slightly effuse; columella almost straight, laminate.

May be compared with *T. albida*, Gray, inhabiting Australia.

#### *T. ROSACEA*, Pease.

*T. aciculari*, gracilis; anfractibus longitudinaliter valde plicato-costatis, interstitiis profunde sulcatis, infra suturam lævibus; apertura oblonga, parva, angusta; columella subrecta; costis albidis, interstitiis, columella, aperturaque, rosaceis.

Long. 20. Diam. 4 mill.

*Hab.* Insl. Oahu.

Shell acicular, slender; whorls longitudinally strongly plicately-ribbed, interstices deeply grooved, except a short space beneath the suture, which is smooth; aperture narrow, oblong, small; columella nearly straight; ribs whitish, interstices, columella, aperture rose pink.

Approaches *T. roseata*, Ad. and Rve. It is more slender, ribs larger, different in color, and interstices between the ribs grooved, instead of clathrated. The latter character, however, is altered in "Con. Icon." from the original, which, however, is

frequently the case throughout that work. The aperture, also, is quite different.

*T. PROPINQUA*, Pease.

*T. subulata*, cylindrica; anfractibus plano-convexis, longitudinaliter valde plicato-costatis, costis angulatis, arcuatis, interstitiis transversim sulcatis; superne sulco cingulatis; apertura elongata; columella recurva, parum contorta; aurantio-rubra, infra suturam alba, costis hic et illic albis, anfr. ultimus albo fasciatus.

Long. 27. Diam. 6 mill.

*Hab.* Insl. Hawaii.

Shell subulate, cylindrical; whorls flatly convex, longitudinally strongly plicately-ribbed, ribs angulate and curved, interstices transversely deeply grooved, above beneath suture encircled by a groove; aperture elongate; columella somewhat recurved and contorted; orange red, between suture and transverse groove, white, ribs here and there white, and the last whorl encircled by a white band.

The above may be distinguished from *T. undulata*, Gray, by the angulation of its ribs, shape of its columella, and in wanting red stains in the interstices of its ribs.

*T. COSTELLIFERA*, Pease.

*T. subulata*, spira gracilis; anfr. plano-convexis, lævibus, longitudinaliter forte angulate plicato-costatis, infra suturam profunde sulcatis; sutura, sulcoque subangulatis; apertura ovata; columella contorto-recurva, laminata; albida, anfr. partem inferiorem cinereis, infra suturam purpurascente cinerea maculosis; apice interdum fulvescente.

Long. 20. Diam. 5 mill.

*Hab.* Insl. Oahu.

Shell subulate, spire slender; whorls flatly convex, smooth, longitudinally strongly angularly plicately ribbed; below the suture deeply grooved; suture and edge of groove slightly angulate; aperture ovate; columella twistedly recurved, laminate. Whitish, lower part of the whorls pale ash color, blotched or spotted below the suture with purplish ash color, apex somewhat yellowish.

The specimens of this species collected do not appear to be mature.

*T. LAUTA*, Pease.

*T. aciculari*, lævis, coruscata; anfr. planatis, longitudinaliter plicato costatis, costis rectis, angulatis, superne interstice punc-



tatis; apertura parva, angusta, oblonga, vix obliqua; columella subrecta, callo crasso marginata, ad basin uniplicata, superne lævis; plumbeo grisea, infra suturas flavescenti cingulata et rufescente fusca maculata; basin fusca, albida aut flavescente unifasciata; columella aperturaque fusca; interdum omnino pallide grisea, aut cinerea, infra suturas maculata.

Long. 26. Diam. 6 mill.

*Hab.* Insl. Oahu.

Shell acicular, smooth, glistening; whorls flattened, longitudinally plicately ribbed, ribs straight, angulate; interstices punctured above; aperture small, narrow, oblong, slightly oblique; columella almost straight, bordered by a laminate callosity connecting with outer lip, at base terminated by a fold, smooth above; color variable, generally of a leaden grey, encircled beneath the suture by a yellowish band, which is spotted with reddish brown; base dark brown, last whorl encircled by a pale yellowish or whitish band; columella and aperture dark brown; sometimes the whorls are wholly ash or grey color, spotted and marked as above.

In good condition, this species is a perfect gem. It approaches nearest to varieties of *T. strigillata*, Linn. On examination, however, it will be found to agree with that species only in the arrangement of its colors.

*T. SULCATA*, Pease.

*T. aciculari*, nitida; anfr. subangustis, infra suturas sulco cingulatis, longitudinaliter plicato-costatis, interstitiis concavis, profunde sulcatis, infra suturas striatis; apertura oblonga angusta; columella lævis, callo marginata, ad labium juncto; cinereo grisea, infra suturas pallidior, interdum costis pallidis.

Long. 15. Diam. 3 mill.

*Hab.* Insl. Oahu.

Shell acicular, shining; whorls rather narrow, encircled below the suture by a groove, longitudinally plicately ribbed, interstices concave, deeply grooved transversely, below the suture striated transversely; aperture oblong, narrow; columella smooth, nearly straight, bordered by a raised callosity, connecting with the outer lip; ashy grey, paler below the sutures, ribs occasionally pale ash color.

The above may prove to be a variety of *T. Swainsonii*, still farther removed from the type than *inflexa*, Pease.

*T. ASSIMILIS*, Pease.

*T. aciculari*, nitida; anfractibus lævis, longitudinaliter angu-

late plicato-costatis, superne, interstitiis punctatis; apertura oblongo-ovata; columella brevi, carinata, contorta; fusca, infra suturas grisea; columella aperturaeque fuscis.

Long. 15. Diam. 3 mill.

*Hab.* Insl. Oahu.

Shell acicular, shining; whorls flattened, smooth, longitudinally angulately plicately ribbed, interstices punctured above; aperture oblong ovate; columella short, keeled, twisted; brown, below the sutures greyish; columella and aperture brown.

*PLEUROTOMA LIRATA*, Pease.

*T. fusiformi*, turrita, undique carinata, carinis subdistantibus, subaequalis, carina in medio anfractuum paulo maxima, superficiali intermediis concavis, carinarum interstitiis tenuiter longitudinaliter striatis; sinu profundo; canali brevi; alba, carinis rufescente fusco maculatis.

Long. 35. Diam. 12 mill.

*Hab.* Insl. Oahu.

Shell fusiform, turritid, keeled all over, keels nearly of the same size, and almost equidistant, the keel on the middle of the whorls slightly the largest, the intermediate surfaces concave, interstices between the keels finely striate longitudinally; sinus deep; canal short; white, keels spotted with reddish brown.

The above species may be distinguished by the regularity of its keels. The spots are small, oblong, and confined to the edge of the keels.

*PLEUROTOMA MONILIFERA*, Pease.

*T. gracile fusiformi*, turrita; anfractibus medio costa nodulosa cingulatis, nodis lateraliter compressis, vix incis, infra carina parva marginatis; medio inter costis nodulosis carina elevata cingulata, interstitiis concavis, elevato striatis, longitudinaliter tenuiter striatis; cinereo-fusca, infra costam pallidior; canali elongato, recto; sinu profundo.

Long. 27. Diam. 8 mill.

*Hab.* Insl. Oahu.

Shell slenderly fusiform, turritid; whorls encircled round the middle by a nodulose rib, nodules compressed laterally and slightly indented on their sides, bordered beneath by a small smooth keel, and a more elevated one intermediate between the nodose rib; interstices concave, elevately striate transversely and finely striate longitudinally; canal long, straight; sinus deep; ashy brown, lighter below the ribs, nodulose rib whitish.

A beautiful species, when in good condition.

Mr. Hinds observed that no species of *Pleurotoma* proper inhabit Polynesia. Such we believe to be the case as regards Southern and Western Polynesia. The above two are the only ones known to me as inhabiting the Hawaiian Islands. Specimens have been laying in my collection for several years past, dead and broken, awaiting the discovery of perfect ones, which are very rarely met with.

MITRA NEWCOMBII, Pease.

T. elongata, subcylindraco-fusiformi; spira brevis, acuta; anfr. plano-convexis, transversim punctato-striatis, interdum striis in medio anfr. ultimo evanidis; anfr. ultimo superne, spiraque striis impressis decussatis; basi remote sulcata, vix truncata; columella quinqueplicata; alba, remote rufescente fusca punctulata; anfr. ultimo fascia lata fusca cingulata.

Long. 27. Diam. 8 mill.

Hab. Insl. Oahu.

Shell elongate, rather cylindrically fusiform; spire short, acute; whorls flatly convex, transversely punctate striate, striæ becoming sometimes obsolete on middle of last whorl; spire and upper part of last whorl decussated by longitudinal impressed striæ; base distantly grooved and somewhat truncate; columella five-plaited. White, remotely punctured with reddish brown dots, last whorl encircled with a broad dark brown band.

Had not Mr. Reeve decided *M. bicolor*, Swain., to be the young of *M. casta*, I should have connected the above species with it as a variety. I am of opinion that the shell figured by M. Kiener, pl. 32, is the above species, especially fig. 106a, though of much smaller size. I have specimens of *M. casta* from both Eastern and Western Polynesia. Those from the west vary in the transverse striæ extending over the upper part of the last whorl. It cannot, however, be confounded with the above species, which resembles in shape *M. filum*, Reeve, to which it is also allied in other respects.

ALCYNA LINEATA, Pease.

T. subelevato-turbinata, crassa, anguste perforata, transversim lirata; anfr. 4, convexis; apertura ovata; labro intus incrassato; liris rubris, interstitiis albidis, apice columellaque albis.

Alt.  $2\frac{1}{4}$ . Diam.  $1\frac{1}{2}$  mill.

Hab. Insl. Oahu.

Shell somewhat elevately turbinate, solid, thick, narrowly perforate, transversely ridged; whorls 4, convex; aperture

ovate; lip thickened within; ridges red, interstices whitish, columella and apex white.

*ALCYNA STRIATA*, Pease.

*T. elevato-turbinata*, solidiuscula, anguste perforata, transversim impresso-striata; anfr. 4, infra suturam angulatis; apertura ovata; labro intus vix incrassato; cinereo, nigroque maculata et punctata, ad suturam albida.

Alt. 2. Diam.  $1\frac{1}{4}$  mill.

*Hab.* Insl. Hawaii.

Shell elevately turbinate, rather solid, narrowly perforate, transversely impressly striate; whorls 4, angulate beneath the suture; aperture ovate; outer lip slightly thickened within, speckled and mottled with black and grey of different shades, whitish beneath the sutures.

Including the above, four species of this genus are known as inhabiting the Hawaiian Islands. They agree in all their characters with genus *Leptothyra*, excepting the distinct prominent tooth at termination of the columella.

*LEPTOTHYRA COSTATA*, Pease.

*T. crassa*, turbinata, anguste perforata; anfr. 4, transversim costatis, medio angulatis, costis mediis maximis, longitudinaliter tenui striatis; apertura subobliqua, fere circularis; albo, nigro, fuscoque maculata et punctata, apice alba.

Alt. 3. Diam.  $3\frac{1}{2}$  mill.

*Hab.* Insl. Maui.

Shell thick, solid, turbinate, narrowly perforate; whorls 4, transversely ribbed, angulate at the middle, ribs largest at the angulation and below, longitudinally finely striate; aperture somewhat oblique, nearly circular; mottled and spotted with white, black and brown, apex white.

*NASSA NUCEA*, Pease. Plate viii, fig. 7.

*T. crassa*, ponderosa, ovata; spira brevis, convexa; anfractibus plano-convexis, undique costis longitudinalibus, sulcis transversa decussatis, costis parvis, confertis, vix arcuatis; anfr. ultimo convexior,  $\frac{1}{2}$  longitudinis testæ superans, basi sulcata; ad suturas anguste marginata; apertura oblongo-ovata, columella, labroque valde liratis; labro varicoso; canali lato; omnino rufescente fusca.

Long. 12. Diam. 7 mill.

*Hab.* Insl. Carolinensis.

Shell stout, heavy, ovate; spire short, convex; whorls flatly convex, decussated throughout by longitudinal ribs and transverse grooves; ribs small, close-set, and slightly curved; last whorl convex more than one-half the length of the shell, and grooved at base; whorls narrowly marginate at the suture; aperture oblong-ovate, columella and outer lip strongly ridged, lip varicose on its outer edge; canal broad; wholly dark reddish brown.

The above is an unusual form for a tropical species. I know of none with which it can be compared.

*NASSA BALTEATA*, Pease. Plate viii, fig. 5.

*T. acuminato-turrita*, *solida*; anfr. 6, *rotundato-convexis*, *sutura impressa*; *longitudinaliter costatis*, *costis 11*, *rotundatis*, *interstitiis transversim sulcatis*; *apertura parva*, *rotundato-ovata*; *labro intus lirato*, *extus varicoso*; *columella callosa*, *tenuiter lirata*; *canali angusto*; *alba*, *fulvescente bifasciata*.

Long.  $8\frac{1}{2}$ . Diam. 4 mill.

*Hab.* Insl. Ebon.

Shell acuminate-turritid, solid; whorls 6, roundly convex; suture impressed, longitudinally ribbed, ribs 11, rounded, interstices transversely grooved; aperture small, roundly ovate; lip ridged within, varicose on its outer edge; columella callous, finely lirate; canal narrow. White, encircled by two yellowish brown bands.

*ENGINA NODULOSA*, Pease. Plate viii, fig. 11.

*T. elongato-fusiformi*, *subturrita*; anfr. *longitudinaliter costatis*, *costis 7*, *parvis*, *non prominentis*, *interstitiis concavis*, *costis transversis decussatis*, *costis 5*, *super costis longitudinalibus nodulosis*, *nodis compressis*, *interstitiis striis elevatis decussatis*; anfr. *superne concavo-angulatis*; *labro dentato-lirato*; *columella lævis*; *canali vix recurvo*; *nigricans*, anfr. *ultimo medio fascia albida cingulata*, *nodis rufescente fuscis*.

Long. 15. Diam. 9 mill.

*Hab.* Insl. Ebon.

Shell elongate-fusiform, somewhat turritid; whorls longitudinally ribbed, ribs 7, small, not prominent, interstices concave, crossed by transverse ribs, five in number, which become nodulous in passing over the longitudinal ribs, nodules compressed, interstices decussated by fine raised striæ; whorls concavely angulated above, below the suture; lip dentately lirate within; columella smooth; canal slightly recurved; blackish, last whorl encircled by a whitish band round the middle, nodules brownish.



*PLANAXIS ATRA*, Pease. Plate viii, fig. 4.

*T.* elongato-ovata; spira gracilis vix acuminata; anfr. plano-convexis, transversim confertissime, tenuiter impresso striatis; apertura late ovata; labro intus incrassato, tenui lirato; columella lævis, infra arcuata, anfr. ultimo partim inferiorem sulcato; canali angusto; ater, sulcis basalis spadiceis, undique setosa.

Long. 8. Diam.  $4\frac{1}{2}$  mill.

*Hab.* Insl. Marquesas.

Shell elongate-ovate; spire slender, somewhat acuminate, whorls planely convex, very finely and closely impressly striate transversely, lower half of last whorl transversely grooved; aperture broadly ovate, lip thickened within and finely lirate; columella smooth, arcuate below; canal very narrow; black, grooves chocolate brown, covered all over with very short, fine bristles.

*RISSOINA BALTEATA*, Pease.

*T.* elongata, gracilis; anfr. convexis, longitudinaliter tenuiter granoso-costatis, transversim tenui striatis; anfr. ultimo ad basin sulcato; apertura elliptica, vix obliqua; labro extus varicoso; alba, fulva unifasciata.

Long. 4. Diam.  $1\frac{1}{4}$  mill.

*Hab.* Insl. Hawaii.

Shell elongate, slender; whorls longitudinally finely granosely ribbed, transversely finely striate; last whorl grooved at base; aperture elliptical, slightly oblique; lip varicose on its outer edge; white, encircled by a single yellowish brown band.

*BULLA CONSPERSA*, Pease. Plate viii, fig. 9.

*T.* ovata, solidiuscula perforata lævis, striis incrementis longitudinaliter tenuiter notata; apertura superne contracta, infra expansa; labro posteriore vix producto; alba, nigra, fuscaque conspersa, versus basin fascea rubra cingulata, plerumque obsoleta.

Long. 27. Diam. 17 mill.

*Hab.* Insl. Marquesas.

Shell ovate, rather solid, perforate, smooth, marked faintly with longitudinal striæ of growth; aperture contracted above, expanded below; outer lip slightly produced posteriorly; white, promiscuously spotted and mottled with white, black and brown of different shades, towards the base encircled with a single red band, which is generally obsolete or altogether wanting.



## ATYS COSTULOSA, Pease.

*T. elongata*, subcylindrica, postice angustiore, alba, umbilicata, longitudinaliter costata, postice et antice striis elevatis decussata; labro postice valde tortuoso et producto; columella ad basin eversa, planulata, appressa; apertura angusta.

Long.  $5\frac{1}{2}$ . Diam.  $2\frac{1}{2}$  mill.

*Hab.* Insl. Oahu.

Shell elongate, subcylindrical, narrowest posteriorly, white, umbilicate, longitudinally ribbed, crossed at either end by elevated striæ, which become more remote towards the middle of the shell, and gradually vanish; outer lip posteriorly strongly twisted and produced; columella everted at base, flattened and appressed; aperture narrow.

I have met with but a single specimen of this interesting species, the sculpture of which is so distinct that it cannot be confounded with any heretofore described.

## PACHYPOMA VIRESCENS, Pease. Plate viii, fig. 10.

*T. conoidalis*, imperforata, medio vix tumida; anfr. superne concavis, oblique, rude, irregulariter rugoso-plicatis, infra ad marginem biseriatim squamatis, squamis nodosis, contiguis, rugosis; suture linearis, undulata; anfr. superioribus profunde foveolatis; anfr. ultimo ad peripheriam acute angulato; basin planulata, conferte squamato-lirata; apertura obliqua, ovalis, interior margaritacea; columella antice tuberculoso dentata; viridescens, squamis, lirisque albidis, columella cærulea circumdata.

Alt. 25. Diam. 25 mill.

*Hab.* Insl. Tarawa.

Shell conoidal, imperforate, slightly swollen at the middle; whorls concave on their upper part, obliquely, rudely, and irregularly rugosely plicate; the lower margin of the whorls encircled by two rows of nodose scales, scales contiguous and rough; suture linear and undulate; upper whorls deeply pitted; last whorl acutely angulate at its periphery; base planulate, encircled with nine contiguous squamose ridges, unequal in size; aperture oblique, oval, interior pearly; columella callosity terminating in a tubercular tooth; greenish, scales and ridges whitish, encircled by a blue line.

The above species is common at certain localities in Polynesia, but invariably thickly coated with lime, except occasionally the young. It was referred several years since, by the late H. Cuming, to *T. confragosus*, Gld. Later, however, it was iden-

tified by him, as well as Dr. Carpenter, as *T. tuberosus*, Phil. In sculpture it agrees in some respects with *confragosus*. It has, however, a double row of scales at margin of the whorls, and Dr. Gould could scarcely have failed to notice its pitted spire and color around columella, which is persistent on specimens the most weathered. Its reference to *tuberosus* must have arisen from an error in the Cumingian collection. That species, as figured and described by Dr. Philippi, is granulose and tuberculose, of quite a different shape and belonging to another genus. No species resembling it inhabits Polynesia. I should look for it among species inhabiting the west coast of America. The shell figured for it in "Conch. Icon.," from the Cumingian collection, resembles the above species in having two rows of scales, but on the figure they are distant from each other, and in several other respects of sculpture, as well as color, it differs from the species described above, and quite distinct from *tuberosus*, Phil. The last whorl of the above species is about one-half the length of the shell, and, with the penultimate whorl, occupies three-fourths of the shell; the whorls above are, consequently, quite narrow and deeply pitted.

From the undulating character of the suture, the rows of scales on the penultimate whorl appear to be on opposite sides of the suture, which, however, is not the case.

#### TRITON INTERMEDIUS, Pease.

*T. fusiformi turrita*, interdum ovato-fusiformi, crassa, transversim noduloso-costata, costis rotundatis, longitudinaliter sulcata aut striata, interstitiis costarum transversim liratis; anfr. convexis, univaricatis, superne infra suturam angulatis; apertura elliptica; columella rugoso-albi lirata, interstitiis nigricibus; labro biseriatis tuberculoso-albidentato, series ad marginem bifurcata, extus valde varicoso; apertura lutea; canali brevi, recurvo, subcontorto; rufescente fusca, anfr. ultimo medio pallide fasciata; varicibus albo nigroque fasciatis; epidermide squamosa induta.

Long. 60. Diam. 30 mill.

*Hab.* Isl. Oahu.

Shell fusiformly turritid, sometimes ovately fusiform, thick, heavy, transversely nodulosely ribbed, ribs rounded, longitudinally grooved or striate, interstices between the ribs transversely ridged; whorls convex, one varix on each whorl, angulated above beneath the suture; aperture elliptical, yellow within; columella ornamented its whole length with white wrinkled ridges, interstices blackish; lip strongly varicose, furnished with two rows of white tuberculose teeth, the one on the edge of the

lip bifurcate; canal short, recurved and slightly twisted; color brownish red, last whorl crossed at the middle with a pale band, varices banded transversely with whitish and black; covered with a scaly epidermis, bearing longitudinal rows of stiff bristles.

The above is intermediate between *aquatilis*, Rve., and *pilearis*, Linn. From the former it differs in wanting longitudinal ribs. Its columella agrees with that of *pilearis*, while its outer lip resembles that of *aquatilis*. In color it differs from both. *Aquatilis* is a ponderous shell, attaining to six inches in length; *pilearis* is lighter and of a more fusiform shape, and *intermedius* partakes of the shape of *aquatilis*, but seldom exceeds three inches in length. The animal of *aquatilis* is of a pale straw color, covered with crowded round spots of various sizes, varying from a light to a dark reddish brown; disk of the foot dull pinkish ash and spotted with reddish brown. *Pilearis* is of a pale cream color, spotted with black.

The animal of *intermedius*, Pse., is covered with spots, irregular in size and shape, of a dark brownish red, margined with yellow, the interspaces of a light reddish fawn; where the spots closely approximate, the interspaces are yellow.

#### MELAMPUS LUCIDUS, Pease.

T. oblongo-ovali, tenuiscula, pellucida, alba, nitida, imperforata; spira brevis, acuta; anfr. marginatis, ultimus in medio planulatis; plicæ parietalis 2, supera parva, fere obsoleta, altera prope basin, transversa, compressa, valida, plica columellaris, obliqua, porrecta, in marginem basalem continuata; labro medio subincrassato, postice vix sinuoso, intus lævi; apertura angusta, basi rotundata.

Long.  $3\frac{1}{2}$ . Diam. 2 mill.

Hab. Insl. Oahu, ? Annaa.

Shell oblong-oval, rather thin, pellucid, white, shining, imperforate; spire short, acute; whorls marginate, last whorl flattened on the middle; two folds on the inner wall of the aperture, posterior one small, almost obsolete, the other near the base, prominent, transverse, compressed; columella fold oblique, porrected, continuous with the basal margin; aperture narrow, rounded at base; outer lip slightly thickened at the middle, and slightly sinuous posteriorly, smooth and simple within.

Two mature and several young specimens were lately found under stones, above high-water mark, at a locality I have frequently marched over; it is, consequently, rare. I have connected with it specimens which I received from the Island of Annaa (Paumotus), not being able to detect any difference,

except in being more abbreviate in shape, and margination at the suture less distinct, and last whorl more convex.

SCALARIA UMBILICATA, Pease.

T. elongato-turrita, umbilicata, alba; anfractibus decem, rotundatis, contiguis, politis, sub-lente remote spiraliter impresso-striatis; varicibus 11, angustis, parvis, vix obliquis, in umbilicum introitis; apertura ovata, postice subangulata.

Alt 10. Diam  $3\frac{1}{2}$  mill.

Hab.—Insl. Oahu.

Shell elongately turreted, umbilicate, white; whorls ten, rounded, polished, contiguous, encircled by fine remote impressed striæ; varices eleven, narrow, small, slightly oblique, entering into the umbilicus; aperture ovate, somewhat angulate posteriorly.

ENGINA LINEATA, Rve. var. *maculata*, Pease. Plate viii, fig. 12.

T. elongato-ovata, crassa, solida, longitudinaliter nodoso-costata, transversim sulcata et tenuiter punctato-striata; anfr. infra suturam subangulatis; apertura angusta, recta; alba, anfr. ultimus, nigro trifasciatus, anfr. superioribus unifasciatis; basi lineis nigris notata; anfr. maculis nigris conspicuis cingulatis.

Alt. 12. Diam. 6 mill.

Hab.—Insl. Apaiian.

Shell elongately ovate, thick, solid, longitudinally nodosely ribbed, transversely grooved and impressly striate, striæ fine and punctured; spire acute; whorls slightly angulated beneath the suture; aperture narrow, straight; white, last whorl encircled by three, upper whorls by one black line, base marked by oblique black lines; whorls encircled by a single row of conspicuous round black spots.

The above is without a doubt a variety of *lineata* Rve., although it would be difficult to distinguish the original species from several others, by the short description given by Mr. Reeve.

CERITHIUM TUBERCULIFERUM, Pease.

1865. *C. Adansonii*, (Rve. non Brug.) Con. Icon. Species 11.

T. crassa, solida, elongato-pyramidata, spiraliter lirata, interstitiis impresso-striatis, tuberculis acutis extantibus armata; anfr. 9, medio subangulatis, ultimus subventricosus; apertura parviuscula, callo postico crasso, canali brevi, labro crenulato, alba, rufescento-fusca punctata.

Shell thick, solid, elongately pyramidal, last whorl slightly ventricose, spirally finely ridged, interstices impressly striate, armed with acute standing out tubercles, the row on the middle of the whorls the largest; whorls 9, somewhat angular at the centre; aperture rather small, posterior callus thick, canal short, outer lip crenulate. White, with occasional reddish brown spots.

*Remarks.*—Authors do not appear to agree as to the species figured by Adanson and described by Bruguiere as *C. Adanson*, inhabiting the West Coast of Africa. The only figure I have met with which agrees with the original, is that in Wood's Ind. Test., all others together with descriptions refer to other species. Mr. Reeve selected a species, collected by Mr. Cuming at the Paumotu, specimens of which I have received from the same locality, where it is found associated with *C. echinatum*, Lam., *C. columna*, Sowb., &c. As it proves to be quite distinct from the Atlantic species, I separate it under the above name, with slight additions to Mr. Reeve's description.

CERITHIUM SCULPTUM, Pease. Plate viii, fig. 8.

T. elongato-pyramidata, subventricosa, aut cylindracea, spiraliter noduloso-lirata, sutura granulis marginata, longitudinaliter obsolete costata, ubique regulariter et conferte impresso-striata; anfr. plano-convexis; apertura magna; canali recurvo, subelongato; alba, apice purpurascens.

Long. 30, Diam. 12 mill.

*Hab.*—Insl. Paumotu.

Shell elongately pyramidal, somewhat ventricose or cylindrical, spirally nodulose-ridged, longitudinally obsoletely ribbed, engraved throughout regularly and evenly with close set impressed striæ; whorls flatly convex; aperture large; canal recurved, rather long and oblique; white, apex purple.

*Remarks.*—In shape the above resembles *columna* Sowb. The small nodules with which it is encircled are regular in size, and it may be distinguished by the whole surface being engraved with spiral striæ. I have specimens from Tahiti, which agree in all respects with the above, except in being cylindrical in shape.

CERITHIUM CYLINDRACEUM, Pease.

T. oblonga, cylindracea, anfr. ultimus subventricosus, spiraliter striata; anfr. supra longitudinaliter nodoso-costatis, costis ad anfractuum ultimum evanescens; apertura magna; canali obliquo, recurvo; labro vix expanso, laqueato; alba, apice, flavescens.



Long. 23, Diam. 8 mill.

*Hab.*—Insl. Paumotu.

Shell oblong, cylindrical, last whorl slightly ventricose, spirally striate; whorls on their upper half nodosely ribbed longitudinally, ribs becoming obsolete on last whorl; aperture rather large; canal oblique and recurved; outer lip somewhat expanded, fluted; white, apex yellowish.

*Remarks.*—The above is intermediate between *C. columna*, Sowb., and *salebrosum*, Sowb. It may be distinguished by the ribs not passing over the whole length of the whorls, and generally absent altogether on the last whorl, except immediately at the suture.

LITTORINA CINEREA, Pease. Plate viii, fig. 14.

T. subglobosa; spira acuta, parva; anfr. supra acute angulatis, transversim granoso-liratis, aut lævibus, interstitiis striis elevatis cingulatis; columella excavata; cinerea, apice nigrescente; columella, aperturaque pallide fuscis.

Alt. 7. Diam.  $5\frac{1}{2}$  mill.

*Hab.* Insl. Marquesas.

Shell subglobose; spire small, acute; whorls sharply angulate above, transversely granosely ridged or smooth, interstices encircled with raised striæ; columella rather broadly excavated; cinereous or whitish, apex blackish, columella and aperture pale brown.

*Remarks.*—This species resembles, in some of its characters, *Fecjeensis*, Rve., and also *granularis*, Gray.

NARICA GRANIFERA, Pease. Plate viii, fig. 13.

T. ventricosus-ovata, crassiuscula, alba, transversim granoso-lirata, interstitiis tenuissime striatis; spira parva, vix exserta; apertura dilatata, ovato-rotundata; umbilica patulo, canali longitudinaliter sulcato et striato, angulo lævis aut sublacerato.

Alt. 9. Diam.  $8\frac{1}{2}$  mill.

*Hab.* Insl. Jarvis.

Shell ventricosely ovate, rather thick, white, transversely granosely ridged, interstices very finely striate; spire small, slightly exserted; aperture dilated, ovately rounded; umbilicus open, canal longitudinally grooved and striate, at the angle on its edge smooth or slightly ragged.

*Remarks.*—The above was classed by the late Mr. Cuming as a *var.* of *N. acuta*, Recl. It agrees with that species, however, only in shape. It is thicker, generally smaller, and granose.



## TORINIA SULCIFERA, Pease.

*T. orbicularis*; spira vix exserta, plana; anfr. sulco-sejunctis, noduloso-costatis, costis 4, nodis lævibus, interstitiis striatis, interstitiis costarum striatis et filo granoso cingulatis; basis plano-convexa; peripheria late sulcata, utrinque costa valida marginata; umbilicus patulus, ad marginem angulatus, intus profunde sulcatus, costa granosa et striis, circumscriptus; apertura circularis; radiatim albo et pallide fusco strigata, apice subnigra, epidermide flavescente.

Alt. 12. Diam. 5 mill.

*Hab.* Insl. Kauai.

Shell orbicular; spire but slightly exserted, apex flat; whorls separated by a deep groove or channel, encircled by four nodulose ribs, nodules smooth, interstices striate, interstices between the ribs striate and encircled by a granulose thread; base flatly convex; periphery widely grooved, angulate on either side, and bordered by a strong rib; umbilicus open, occupying one-half the diameter of the shell, angulate on its edges and broadly and deeply grooved just within, encircled with a granulose rib and striæ; aperture circular; radiately striped with white and light brown, apex dark brown, epidermis yellow.

*Remarks.*—*T. cylindracea*, Chem., is probably the nearest allied species to the above, from which it differs mainly in the characters of its umbilicus and periphery.

REMARKS ON MARINE GASTEROPODÆ, INHABITING THE  
WEST COAST OF AMERICA; WITH DESCRIPTIONS OF  
TWO NEW SPECIES.

BY WM. HARPER PEASE.

TORINIA PERSPECTIVIUNCULA, Chem.

In "Monograph of Solarium," Thes. Conch., three distinct forms of *Torinia*, inhabiting respectively the West Coast of Africa, the Hawaiian Islands, and the East Indies, are united under the above name. Dr. Carpenter, in his last Report on Mollusca of the West Coast of America, adopts the same synonymy.

By comparing a large number of specimens, from various localities, the animals of two of the forms and the operculum of all, I am convinced they are three distinct species, which may be distinguished by the shell as well as the animal.

I would first observe, that there is more than one species of *Torinia* inhabiting the West Coast; I refer herewith to that figured in Thes. Con., figs. 61, 62, specimens of which I have received from Margarita Bay, and also La Paz, collected alive, in company with another species, rather smaller and more depressed.

At the Hawaiian Islands several species remain to be described. I refer to those formerly distributed by me as *T. variegata*, Chem., and latterly as *T. areola*, Desh.

All species of *Torinia* may be arranged under three distinct shapes.

1. Trochoidal *T. variegata*, Chem., &c.
2. Conoidal *T. athiop*, Mke, &c.
3. Planulate *T. cylindracea*, Chem., &c.

Species of all three of the above shapes are included in the synonymy of *T. perspecti*, &c., Chem., Thes. Con.

*T. planulata*, fig. 63, named as a variety, is a distinct species, as the author suggests. I have received several species of this form from different localities in Polynesia: only two, however, in condition for description, viz., *T. discoidea*, Pse., and *T. sulcifera*, Pse.

The conoidal form, referred to in Thes. Con., from Borneo, is probably also distinct. I received from the late Dr. Gould a specimen of that shape, collected in the Sooloo Seas, resembling *cethiopsis*, Mke.

Separating the planulate and conoidal forms from *T. perspecti*, &c., in Thes. Con., the three species remaining may be distinguished by the following characters:—

The West Coast species is the largest, most elevated and whorls generally more convex, and rounded at periphery of last whorl. The East Indian form is the nearest allied to it in those characters, while the Hawaiian species is depressed and the whorls generally more flat.

The sculpture of the West Coast species agrees more nearly with the Hawaiian. The concentric ribs being flat or planely convex, the intervening groove being light and the radiating striæ finer and more continuous; while the sculpture of the East Indian form is more coarse and bold, the concentric ribs rounded and more distinct, the grooves intervening being much deeper.

In color the West Coast and Hawaiian are more plain, the former more brown, the latter darker, and more or less spotted with white at the suture and on the periphery of last whorl, and encircled with white at margin of the umbilicus. The East Indian is variegated with white and black, either tessellated or disposed in radiating lines, and generally a white band following the suture.

The operculum of the Hawaiian and East Indian agree, and is well figured in Adams' "Genera." That of the West Coast species differs widely. It is composed of plates disposed in the shape of a screw, of three whorls. The plates are wide apart, and furnished on their edges with short, stout bristles, and the sides coarsely reticulated with raised striæ. (Plate viii, fig. 6.)

The animal of the East Indian species is fairly represented in Voy. d'Astrolabe, and agrees with my observations, except that the emargination in front is too angular. The dilatation of the anterior corners of the foot is common to all the species I have examined. The animal of the Hawaiian species differs from the above in the tentacles being longer and more slender, "the foot widest posteriorly," and color pale cinereous. I may as well note here that the animal of *T. Mighelsii*, Phil., agrees with the above in general shape. Its tentacles are, however, setaceous, and color pale cream. Both species inhabiting the Hawaiian Islands are found almost invariably on branched coral, and suspend themselves by strong gelatinous threads, one of which will sustain the weight of several shells and can be drawn out four or five inches.

The geographical range of the West Coast and Hawaiian species is limited. Although the East Indian is widely distributed from the Red Sea to the Philippines, and from thence through Polynesia to the Paumotus and south to New Caledonia, it retains its characters, which distinguish it from the Hawaiian, and more widely from the West Coast species. The variation at the Paumotus, noticed by Mr. Hanley, is common to the species of several genera, as remarked by me in this Journal, 1868, page 109.

As to the names by which the several species should be designated, I would first remark, that it is not probable nor possible that Chemnitz ever saw a specimen of *Torinia* from the West Coast of America. Captain Cook visited the West Coast only on his last voyage, and then at the North-west, the expedition reaching England a short time before the date of Chemnitz's publication. He described and figured, without doubt, the East Indian form, although his obscure figures and short description has been and may be referred to several species, as well as those of other early authors. All species of *Solarium* were classed by them as large or small, or as "perspectives" or "perspectivunculus" generically. The specific name of the East Indian species should remain as adopted by Lamarck, Deshayes, and others, *T. variegata*, which alludes to the disposition of its colors. The Hawaiian species has been recognised by several of my correspondents as *T. areola*, Desh., which I have adopted, although the description of that species requires to be somewhat modified, especially as to color and its disposition.

The name of the West Coast species remains to be determined by those more particularly interested in that fauna.

#### TROCHUS BYRONIANUS, Gray.

Having had opportunity of examining the original figure of the above species in Wood Ind. Test., I discover it to be quite distinct from our common Hawaiian species, *Polydonta Sandwichensis*, Soul. No species of *Omphalius* inhabits Polynesia. The above should be connected with some one of the West Coast species. The type, according to Dr. Gray, is awaiting determination in the British Museum.

#### COLUMBELLA ROSIDA, Rve.

The above should be discarded from the West Coast fauna. I have received specimens from its original locality, and several others in Southern Polynesia. For my remarks on its variation, refer to page 122 of this Journal, 1868.

A number of species, inhabiting the West Coast or the Gallapagos and Polynesia, have been confounded, for reason of Mr.

Cuming having collected at two islands of the same name (Lord Hood's Island), one in the Gallapagos group and the other at the Paumotus.

Lord Hood, when a young man, accompanied Captain Cook on his third voyage as midshipman. Subsequently three islands were named after him. The one at the Gallapagos may retain his name; that in the Paumotus should be designated by its proper native name, "Maurukea," and also the one at the Marquesas, "Fatu-Haku."

NASSA TIARULA, Kien.

A large and beautiful collection of shells, dredged the past year by a gentleman on the West Coast of Mexico, which I have had opportunity of looking over, contained a number of specimens of the above species, which leave no doubt but that it is a variety of *N. tegula*, Rve, having light colored specimens in my collection, from La Paz, which closely connect it. The original locality, by Kiener, copied by Reeve, "Madagascar," is probably an error.

LATIRUS NODATUS, Martyn.

The above should also be struck out of the West Coast fauna. The locality given to it originally by Martyn, "New Holland," should probably have been "South Seas." In Voy. Blossom it is properly credited to the Pacific.

Mr. Reeve, however, in Con. Icon., gives "Panama" (Cuming) as its locality, which has consequently been adopted by several authors. Not one of the numerous collectors that have visited that locality since, so far as I can ascertain, have confirmed it.

It occurs very rarely at the Hawaiian Islands, and I have received it from Southern and Western Polynesia.

MUREX FOVEOLATUS, Pease. Plate viii, fig. 3.

*T.* acute ovata, crassa, imperforata, spira gracilis, acuta, brevis,  $\frac{1}{2}$  longitudinis testæ haud æquans; anfr. ultimus, varicibus 5, prominentis, lateraliter profunde et late foveolatis, squamosis, instructus, interstitiis lævibus; apertura ovali; columella vix arcuata, lævi; labro regulariter arcuato, late varicoso, radiatim costato, costis canaliculatis, interstitiis elegantissime foliaceis, ad limbum acuto; erinulato, intus lævi; canali brevissimi, recurvo, fere clauso.

Alba, interstitiis varicorum, pallide rosacea suffusa, anfr. ultimus, et spira ad suturam, fascia angusta nigra, cingulatis.

Alt. 15. Diam. 9 mill.

*Hab.*—La Paz, in sinu Californico.

Shell acutely ovate, thick, solid, imperforate, spire slender, acute, short, less than one-half the length of the shell; last



whorl furnished with five prominent varices, which are deeply and openly pitted on the sides and squamose; interstices smooth; aperture oval; columella slightly arched and smooth; outer lip regularly arched, broadly varicose; varix radiately ribbed, ribs canaliculate, interstices beautifully foliated; edge acute, crenulate, smooth within; canal very short, recurved, nearly closed. White, interstices between the varices suffused with pale flesh color; last whorl just beneath its middle, and spire at the suture, encircled by a narrow black band.

*Remarks.*—All the specimens of the above received were very much encrusted, with the exception of the one figured.

The species nearest allied is *M. alveatus*, Kien.

OMPHALIUS TURBINATUS, Pease. Plate viii, fig. 15.

T. subdepresso-turbinata, crassa, late et profunde umbilicata; anfr. supra angulatis, ultimo ad peripheriam obsolete angulato, liris paribus nodulosis cingulatis, basi convexa, lævis aut obsolete lirata, regione umbilicali lævis; columella ad basim nodoso dentata, dente parvo, vix elevata terminata (non sulcata). Flavesciente aut albida, radiatim lineis rufescente-fuscis notata, lineis obliquis et interruptis, base rufescente-fusca maculata, umbilicus, columellaque viridis.

Alt. 18. Diam. 13 mill.

*Hab.*—La Paz, in sinu Californico.

Shell somewhat depressly turbinate, thick, solid, openly and deeply umbilicate; whorls angulate above, the last obsoletely angulate at periphery, encircled by small slightly nodulous ridges, interstices elevately striate, base convex; smooth or obsoletely ridged, at the umbilical region smooth; columella at base nodosely dentate, and terminating in a very slightly elevated tooth (not grooved). Yellowish or whitish, radiately obliquely marked with fine reddish brown interrupted lines, base spotted with reddish brown, umbilicus and columella sea green, operculum bright yellow.

The young is more depressed, more sharply angulate, and very finely and closely striate concentrically, and also of a darker color.

*Remarks.*—The species nearest allied to the above, so far as I am aware, is *O. coronulata*, C. B. Ad. It may also be compared with *O. ligulatus*, Mke. It may be readily distinguished from either of those species by the shape of its base, the columella tooth projecting much more and no trace of a groove. The umbilicus is also more open, smooth around its outer edge, and colored green as well as the columella. Its sculpture is also much lighter.



**CORRECTIONS AND ADDITIONS TO "SYNONOMY OF  
MARINE GASTEROPODÆ INHABITING POLYNESIA."**

(Amer. Jour. of Conch., Vol. 4, 1868, page 103.)

BY WM. HARPER PEASE.

**MITRA TURGIDA, Rve.**

1845. Proc. Zool. Soc. London, p. 52.

" Con. Icon., species 273.

1860. *M. ericea*, Pse., Proc. Zool. Soc. London, p. 146.

The first specimens collected and forwarded to London were in poor condition; others found since leave no doubt as to the above synonymy.

**MITRA LUBRICA, Pse.**

1867. *M. glabra*, Pse., Am. Jour. Conch. p. 272.

Name preoccupied; changed as above.

**CERITHIUM PIPERITUM, Sowb.**

Thes. Con., species 76.

1854. *C. alveolus*, Jacq., Voy. au Pol. Sud., vol. 5, p. 105, pl. 24, f. 28, 29.

**CERITHIUM TUBERCULIFERUM, Pease.**

1865. *C. Adansonii*, Rve. non Brug., Con. Icon., Sp. 11.

The above species, collected by Mr. Cuming at the Paumotus, is decidedly distinct from the one inhabiting the west coast of Africa, described by Bruguiere as *Adansonii*. The figure and description in Con. Icon. refer to the Polynesian species, which I separated as above.

**CERITHIUM MACULOSUM, Migh.**

*C. nassoides*, Sowb., Thes. Con., Sp. 114.

1865. " Rve., Con. Icon., Sp. 97.

The above synonym should be added on page 127 of my previous paper.

## TEREBRA BIPARTITA, Desh.

The above is a small slender species, quite distinct from *hastata*, Gmel., with which Mr. Reeve has connected it.

## TEREBRA PEASEI, Desh.

Is a synonym of *T. puncticulata*, Desh., as classed by Mr. Reeve, and not a variety of *T. Swainsonii*, Desh., as noted by me in my previous paper, p. 125. I was led into the error by the typical specimens forwarded me from Europe, being wrongly labelled. The species for which it was mistaken I have described as *T. Swainsonii*, var *inflexa*.

## TORINIA TROCHOIDES, Desh.

In my last paper I suggested that *dealbata*, Hds., might be a synonym of the above. I discover that Mr. Hanley had already decided it to be so. I am of opinion that *T. conica*, Pse., Proc. Zool. Soc. London, 1865, is at least a variety, although the late Mr. Cuming supposed it to be distinct.

It differs from the description of *trochoides* in being concentrically striate and in having more color. The specimens from which the description of Hinds and Deshayes were drawn up may not have been as perfect as those I received.

## MARGARITA ANGULATA, A. Ad.

The above should be erased from the synonymy of *Trochus tantillus*, Gld., page 131 of my previous paper.

Having noticed it in the catalogue of Australian species by Mr. Angas, classed as *Minolia*, I was led to examine its description, and discover it differs from the Hawaiian species in being "openly umbilicate" and whorls angular above. The locality given by Mr. Adams, "Sandwich Islands," was probably the cause why Dr. Gould and others adopted the synonymy I followed.

## TRITONIDEA UNDOSUS, Rumph.

*Buccinum cinctum*, Quoy, should be transferred from the synonymy of *T. fumosus*, Dill., to that of the above, in my previous paper, p. 104.

## TRITONIDEA FUMOSUS, Dill.

1832. *Buccinum undosum*, Quoy, non Rumph., Voy. d'Astrol., Vol. 2, p. 411, pl. 30, fig. 1—4.

The above should be added on page 104 of my previous paper.

## LATIRUS COLUMBARIUM, Chem.

1788. *Murex columbarium*, Chem., Conch. Cab. vol. 10, p. 284, pl. 169, f. 1637—38.

1789. *Murex spinosus*, Martyn, Univ. Conch. pl. 4.  
 1791. " *columbarium*, Gme., Syst. Nat. p. 3559.  
 1817. " " Dill., Cat. vol. 2, p. 738.  
 1843. *Turbinella spinosa*, Desh., An. sans Vert., vol. 9, p. 392.  
 1847. " " Rve., Con. Icon., Sp. 43.  
 " *fasciata*, Sowb., ?  
 1856. " *columbarium*, Wood, Ind. Test., pl. 27, fig. 117.  
 1854. " *spinosa*, Jacq., Voy. au Pol. Sud. p. 112, pl. 25, f. 28, 29.

*Remarks.*—The Chemnitzian name of the above species, discarded by Deshayes and Reed, should be restored.

#### CYPRÆA CAPUT SERPENTIS, Linn.

1758. Systema Naturæ, p. 1175, ed. 10.  
 1770. Hist. Conch., Lister, pl. 701, f. 49 and pl. 704, f. 53.  
 1849. Var. *caput anguis*, Phil., Zeitz. fur Mal. p. 24.

*Remarks.*—The species described by *M. Philippi* as above, is a distinct variety of *caput serpentis*. Although separated by Lister, it has escaped the notice of authors since.

Compared with *caput serpentis*, it is smaller in size, not dilated at the sides, darker in color throughout, and dorsal spots smaller. The only description of the animal of *caput serpentis*, published, so far as I can discover, is that in "Voy. d'Astrol," from which *caput anguis* differs as follows: Mantle of a deep brown, shaded with dark green, its tentacular processes red or red and white. Siphon dusky, tentacles beyond the eyes light chestnut, base white. Foot pale beneath and dusky above. The tentacular fringe surrounding the end of the siphon is retractile. The colors and their arrangement agree with the type, only darker.

#### CONUS NEGLECTUS, Pse.

1860. Proc. Zool. Soc. London, p. 398.

Although considered by the late Mr. Cuming to be distinct, I have classed it as a variety of *C. flavidus*, Lam. It differs only in the spire being flat or nearly so, occasionally slightly concave, and its epidermis thicker and more rough.

The following corrections should be made in the text of my previous article.

- Page 117, 11 lines from bottom, read "Iopas" for "Jopas."  
 " 120, 3 " " " " "it" for "other species."  
 " 113, 10 " " " " "Lam" for "Linn."  
 " 112, 21 " " " " "lives" for "lies."  
 " 108, 3 " " " " "the synonymy of *dispar*" for "the last synonymy."

NOTES UPON THE MONOGRAPH OF THE GENUS MARGINELLA IN REEVE'S CONCHOLOGIA ICONICA.

BY JOHN H. REDFIELD.

We can hardly over-estimate the aid which Mr. Reeve has afforded to Conchological students in the immense store-house of illustrations contained in his series of monographs. In regard to the older and better known species of shells, the work has been of great service by bringing within reach of students good figures which would otherwise have to be sought through a host of works, many of which are rare and not readily accessible. And as to more recent and less known species, Mr. Reeve's access to the magnificent collection of Mr. Cuming has enabled him to introduce to science novelties almost without limit. But it cannot be denied that the very plan of the work, well conceived as it was, and carried out with a wonderful perseverance and regularity—by its inexorable demand of a certain number of figures and descriptions per month, necessarily led to undue haste, and prevented the careful investigation that was oftentimes required. So also the style of lithography adopted, while admirable for large species, failed entirely to do justice to small species, especially where their distinctive characters were minute or intangible. The frequent errors of statement in regard to habitat are perhaps the most mischievous fault that can be brought against the work, for on them are liable to be based erroneous conclusions in regard to the important questions of geographical distribution, and of permanence in species. Doubtless many of these errors are due, as Mr. Gray has recently observed,\* to the wrong or misplaced labels in Mr. Cuming's cabinet. Mr. Reeve and Mr. Cuming have (alas!) passed away, both deceased in the same year in which the monograph of *Marginella* was completed. No lover of shells can have other than respect for their memory, and gratitude for their labors, and I am sure

\* See this Journal, vol. 4, pages 201–203.

that I fail in neither, in here presenting some criticisms upon the monograph of *Marginella*, which was completed in 1865; for my sole object is to indicate what seem to me errors too important to pass unquestioned, or to call attention to points which need further investigation.

And I would remark generally, that while the larger species of *Marginella* are for the most part as well defined in form and marking as are the species of *Cypræa*, the great number of smaller species which have been brought to light in recent years form groups which from want of positive distinctions of color and pattern, and from the slightness of deviation in form, are most perplexing to the student. For their proper delineation, the highest style of art is required;\* for their distinction, both back and front views are needed, and their proper characterization should be based only upon fresh, bright and perfect individuals. Mr. Reeve's plates of the smaller species often fail in all these respects, while his descriptions are vague and insufficient. Hence of the species which he has for the first time named, many must remain doubtful, especially as in so many of them the habitat is unknown.

Referring to the species in the order of the monograph, I offer the following notes:

*Sp. 6. Marginella Petitii*, Duval. The habitat of this species is left in doubt by both Sowerby and Reeve, but it is known to inhabit the coast of Senegambia, West Africa.

*Sp. 13. M. pyrum*, Gron. The quoted synonym of *Voluta picta* should have been referred to Dillwyn instead of Gmelin.

*Sp. 14. M. rosea*, Lam. I believe that Senegal should be omitted from the habitats of this species, although the authority of both Kiener and Sowerby may be pleaded for it. The remaining localities given by Reeve, to-wit,—Cape of Good Hope and Natal—are certainly correct, and, so far as I know, it is limited to that region.

*Sp. 15. M. Newcombi*, Reeve. I see no reason why Reeve should have considered this a doubtful species. It certainly has very slight affinity to *M. rosea*, Lam.

*Sp. 17. M. vittata*, Reeve. This species has no habitat assigned. It was sent me many years ago by Mr. Cuming, as from East Africa, and it has just enough relationship to *M. pyrum*, Gron., to render that habitat probable. Sowerby's *M. intermedia*, not mentioned by Reeve, is closely allied.

\*Even in Kiener's beautiful plates the smaller species of *Marginella* are very badly and imperfectly rendered.

*Sp. 44. M. cincta*, Kiener. To say that this "inhabits Mexico," leaves us in doubt whether it be an Atlantic or Pacific species. It doubtless inhabits the Caribbean coast of Mexico, but its province includes the Antilles and the northern coast of S. America. Candé and d'Orbigny quote it from the Antilles, C. B. Adams collected it in Jamaica, I have it from Carthagena, S. Am., Krebs received it from St. Martha, and Newton collected it at Maracaibo.

*Sp. 45. M. prunum*, Gmel. The only locality quoted by Reeve for this species is Panama. The Panama shell of this type is well known to be *M. sapotilla*, Hinds, a species so closely allied indeed to *M. prunum*, that some would question its specific validity. Mr. Reeve has, however, adopted the *M. sapotilla* as a good species, justly as I think, and has correctly assigned it to its proper province—Panama. It is in fact the Pacific analogue of the Caribbean *M. prunum*, and it is surprising that Sowerby and Reeve should both have neglected to record the latter as coming from the Caribbean province, where it is one of the most abundant species, being indeed the best known and the typical species of the genus. And as they have each blundered in ascribing it to Panama, so it is even more surprising that almost all their predecessors from Gmelin down refer it only to the island of Gorée, West Africa, where I feel confident in asserting that it never occurs. That this locality should have passed unquestioned for more than sixty years may be thus explained. Gmelin's description confounds two distinct species, viz., the *M. amygdala*, Kiener, which abounds on the coast of Senegambia, and the true *M. prunum*, or what is usually considered such, (*M. cœrulescens*, Lam.), which is the Caribbean species. Gmelin's description though vague, best applies to the latter, and the dimension he gives ( $1\frac{1}{2}$  inches long) can only agree with that. Of his cited figures, the first is the *Egouen* of Adanson, which Adanson says is only 9 lines in length, and which is clearly Kiener's *M. amygdala*. The second figure referred to is that of Lister, which represents an immature *M. prunum*, while the third is that of Martini, which is unquestionably *M. prunum*. Gmelin then copies Adanson's locality "Gorée" for the species, which in turn has been blindly repeated by Dillwyn, Wood, Lamarek and Kiener. Petit, in his Catalogue, Jour. de Conch. ii, 53, has been the first to set this matter right, by removing Adanson's *Egouen* to its proper place with Kiener's species. On the distribution of *M. prunum* and *M. sapotilla*, see also C. B. Adams, in Ann. N. Y. Lyc. Nat. Hist. v, 265.

*Sp. 48. M. quadrilineata*. Mr. Reeve does not inform us



that this was first named and described by the Rev. Mr. Gaskoin, in Proc. Lond. Zool. Soc. for 1849, p. 17.

*Sp. 51. M. oblonga*, Sw. Reeve quotes *M. carnea*, Storer, and *M. amabilis*, Redf., as synonyms of this. As regards the latter I am disposed to acquiesce in this opinion, for since my description of it was published, an examination of more extensive suites of specimens has shown that it is difficult to define a satisfactory separation. But I still regard Storer's *M. carnea* as a valid species, the pattern and coloring of which are always sufficiently distinct from *M. oblonga*. The group is, however, a perplexing one, and I have recently seen two or three specimens intermediate between *M. oblonga*, Sw., and *M. guttata*, Dillw., having the form and ground work of color of the former, with the white flecks of the latter, and I suspect that *M. nivosa* in like manner connects *M. guttata*, Dillw., with *M. pruinosa*, Hinds.

*Sp. 55. M. angustata*, Sow. Ascribed to Brazil, erroneously I think. Sowerby referred it to the East Indies. Kiener (mistaking it for *M. bullata*), says it inhabits the Indian Ocean. My specimens came from Ceylon.

*Sp. 57. M. persicula*, L. The well marked variety named by Lamarek *M. avellana*, is omitted from the synonymy. If dropped as a species, it still deserves mention as a variety.

*Sp. 61. M. similis*, Sow. This name must give place to *M. obesa*, Redf., which has precedence by eight months, as I have already noted in Ann. N. Y. Lyc. Nat. Hist. iv, 494. (The shell which Sowerby at a later date named *obesa*, for which I proposed (loc. cit.) the name of *M. pyrulata*, but which I suspect is only a variety of *M. labiata*, Val., is omitted from Reeve's Monograph). Although Mr. Reeve figures and describes my *M. obesa*, (under the name of *M. similis*), he thinks it may probably be only a variety of *M. interrupta*, Lam. I must continue to dissent decidedly from this view, referring to my full description in Ann. N. Y. Lyc. Hist. iv, 164, 165, for a detail of the differences, which are constant and sharp. At Carthagera, S. A., both species occur together, always readily distinguishable. At St. Martha the *M. interrupta* is found alone.

*Sp. 65. M. maculosa*, Kiener. The shells figured under this name are certainly not Kiener's *M. maculosa*, nor do they hardly answer to *M. guttata*, Sow., which I have learned to regard as distinct. They are more nearly related to Swainson's shell than to Kiener's, but without inspection of the types referred to by Reeve, I do not think proper to propose a new name.

*Sp. 67. M. phrygia*, Sow.—If we refer to the figure of Swainson's *M. guttata*, in Zoological Illustrations, 2d series, vol. i, pl. 44, f. 2, and then select from Sowerby's and Reeve's figures the one which approaches nearest to it, we shall in each case be led to that of *M. phrygia*, Sow., and I think no one can make this comparison without being satisfied that Sowerby, in describing that species, had Swainson's shell before him. Swainson's name had long before been preoccupied by Dillwyn, and must hence be dropped. Petit had, therefore, proposed, in 1851 (*Journ. de Conch.*, ii, 55), to change the name to *Swainsoniana*; but as Sowerby's *phrygia* was described in 1846, it may properly be retained, with *M. guttata*, Sw., and *M. Swainsoniana*, Petit, as synonyms.

*Sp. 68. M. DeBurghiae*, Reeve.—A very distinct species, rare in collections, for the possession of which I am indebted to the kindness of Mr. D. W. Ferguson, of Brooklyn, N. Y.

*Sp. 69. M. muralis*, Hinds.—This species, carefully described by Hinds in *Proc. Lond. Zool. Soc.*, 1844, p. 76, under the impression that it differed from Kiener's *M. maculosa*, must, I think, be referred to that species. It agrees well with Kiener's figure, and is, in fact, the only species figured by either Sowerby or Reeve which does answer to that. Kiener's description also applies, except as to the "smooth labrum," while both figure and description apply to Hinds' shell far closer than to the *M. guttata*, Sw. If my views be correct, the species must resume the name of *M. Maculosa*, Kiener, and *M. muralis*, Hinds, must take the place of synonym.

*Sp. 70. M. sagittata*, Hinds. Not so well figured as in Sowerby. I cannot distinguish *M. fluctuata*, C. B. Ad. (*Contr. to Conch.*, p. 56), from this.

*Sp. 71. M. frumentum*, Sow. Here ascribed to the West Indies, and so also in Sowerby's *Thesaurus*; but in Sowerby's original description (*Proc. Lond. Zool. Soc.*, 1832, p. 57) it is said to have been brought by Mr. Cuming from St. Elena and Salanga (Ecuador). I suspect that this is correct, the West Indian species of this type being *M. sagittata*, as above.

*Sp. 72. M. catenata*, Mont. Two species are here confounded under this name. Fig. 72, *a, b*, represent the true *catenata*, while Fig. 73 is evidently drawn from *M. pulcherrima*, Gaskoin (described in *Proc. Lond. Zool. Soc.*, 1849, p. 21), a species similar in size and form to the *catenata*, but differing widely in its minute markings.

*Sp. 75. M. oryza*, Lam. Very properly restored to its place as a species distinct from *M. miliaria*, L.

*Sp. 81. M. lactea*, Kiener. As only the back of the shell is figured, the more essential characters are not seen; but as the description states the columella to be three-plaited, it cannot be Kiener's shell, which he distinctly describes as "*quadriplicata*." Reeve's shell is doubtless the *M. subtriplicata*, Orb., closely allied, but differing by having only three plaits, which are also more oblique than in *lactea*. Reeve's figure 135, on plate 24, also represents the *M. subtriplicata*. Both species are found at various points in the Caribbean province.

*Sp. 83. M. avena*, Val. The shell here figured is not the usual typical form, but that which Bernardi has described and figured in Petit's Journ. de Conch., iv, 149, as *M. Beyerleana*. I have hitherto regarded this as a distinct species, characterized by the interrupted character of its rose-colored bands; but some specimens have recently been sent me by Mr. D. W. Ferguson, in which these bands—while still of a bright rosy tinge—are free from interruption, and well connect the *Beyerleana* with the ordinary or more fulvous variety.

*Sp. 85. M. taniata*, Sow. Neither Sowerby nor Reeve gives the habitat of this species. I have specimens from the Bahama Islands.

*Sp. 87. M. conoidalis*, Kiener. *M. apicina*, Menke, which is quoted as a synonym, should take precedence.

*Sp. 88. M. pruinosa*, Hinds. This figure approaches the Carolina shell which I have named *M. roscida* (Proc. Phil. Ac. Nat. Sci., xii, 174), though it shows less angularity of the body whorl. A comparison of the original types may, perhaps, show them to be identical. Mr. Conrad (Am. Journ. Conch., iv, 67) says he is unable to distinguish my *M. roscida* from his *M. limatula* (fossil). In a fossil state the flecking of the *M. roscida* would readily disappear, and I think further examination may establish the identity of the two, in which case Mr. Conrad's name would take precedence over all.

*Sp. 90. M. Sauleyana*, Petit. The figure certainly represents, not the *Sauleyana*, but *cincta*, so as to fully justify Reeve's remark that it is "very closely allied to *M. cincta*, and possibly a variety of that species." But *M. Sauleyana*, Petit, is, in my estimation, quite a different affair, being identical with *M. Storeria*, Couthouy, referred to in my note on the next species.

*Sp. 92. M. crassilabrum*, Sow. This is certainly not Sowerby's shell, which, as figured in *Thesaurus Conch.*, is a small species, only 5 lines in length. Reeve's shell is a larger, well-known species, inhabiting Brazil and a portion of the Caribbean province, and which was first described by Couthouy in *Journ. Bost. Nat. Hist. Soc.*, under the name of *M. Storeria*. I cannot doubt that it is identical with *M. Sauleyana*, Petit, *not Reeve*. The West African *M. amygdala* is allied to it, but is less shouldered, and altogether a less solid shell.

*Sp. 98. M. vexillum*, Redf. My name is quoted as a MS. name in Cuming's collection, but my description was published in 1852 in *Ann. N. Y. Lyc. Nat. Hist.*, v, 224. But it was not there figured, as the shell is exceedingly rare; and, as the example figured by Reeve is far less perfect than my own, I now present a figure of it which better shows the characteristic markings of the species. See plate 8, fig. 2, referring to the above work, for the full description.

*Sp. 99. M. bibalteata*, Reeve. Habitat blank. This seems to me to be the *M. gracilis*, C. B. Ad., from Jamaica, described in 1851 (*Ann. N. Y. Lyc. Nat. Hist.*, v, 46). The late Prof. Adams sent types of his Jamaica species to Mr. Cuming, and they should have been known to those who had charge of the collection.

*Sp. 100. M. livida*, Reeve. Habitat blank. Very near to the small varieties of *M. avena*, Val.

*Sp. 103. M. naviella*, Reeve. Habitat unknown. Identical, I think, with *M. rubella*, C. B. Ad., in *Proc. Bost. Nat. Hist. Soc.*, ii, p. 1, 1845, from Jamaica.

*Sp. 107. M. alabaster*, Reeve. A species without habitat assigned, and of which only the back is figured. Very close to Sowerby's *M. fauna*, which is not mentioned by Reeve—the chief difference seeming to be that Sowerby's shell had a slight tinge of color, while this is perfectly white. Sowerby, in the *Thesaurus*, says that the habitat of *M. fauna* is unknown; but in his description in *Proc. Zool. Soc.* he refers it to Curaçoa. I have specimens from Cuba which answer very closely to Reeve's *alabaster*, which strengthen my impression that *M. fauna* and *M. alabaster* are one, belonging to the Caribbean province.

*Sp. 111. M. monilis* (L.). Petit (in *Jour. de Conch.*, ii, 57) has well distinguished two forms which have been confounded under this name. For that figured by Sowerby he has proposed the name of *Soverbiana*. Reeve's figure represents the true

*monilis*, but his description better suits Sowerby's shell, for he says it is 4-plaited, while the true *monilis* is 5 and 6-plaited.

*Sp. 121. M. chrysomelina*, Redf. No relation to *M. maculosa*, as Reeve suggests, but more allied to *M. multilineata*, Sow.

*Sp. 123. M. margarita*, Kiener. Repeated from plate 16, but this time with the wrong habitat of "India." In the first description it is correctly given "West Indies." See note on *M. candida*, Sow., farther on.

*Sp. 124. M. serrata*, Gaskoin. Quoted only as a MS. name, though Gaskoin's description appeared in Proc. Lond. Zool. Soc. 1849, p. 19. Gaskoin's habitat, Mauritius, is more likely to be correct than Reeve's, which is West Indies.

*Sp. 126. M. triplicata*, Gaskoin. Quoted only as a MS. name, though described in *loc. supra cit.* It is surprising that Gaskoin's paper is entirely ignored in this monograph.

*Sp. 134. M. candida*, Sow. I cannot distinguish this from *M. Margarita*, Kiener. Had either of Reeve's figures of the latter given a front view, it might have aided us to decide. I can see no essential difference between Sowerby's figures of the two species. Kiener's figure of *M. Margarita* shows a more rounded shoulder, but his figures of the small species in this genus are very inaccurate, as already remarked.

*Sp. 145. M. semen*, Reeve. Compare with *M. ovuliformis*, Orb., which it much resembles.

*Sp. 154. M. Miliaria* (L.). Very badly figured.

In this monograph Mr. Reeve has added about 40 species (some perhaps doubtful) to those already known, while he has omitted about 50 species previously published, many of the latter being little known or doubtful. Among those omitted are several of the species of Sowerby's monograph. The *M. triticea*, Lam. (by some referred to *M. exilis*, Gm.), is among the omissions, and the group of which that species is a representation needs further elucidation.

Mr. Reeve's monograph enumerates (deducting some species twice figured) 154 species, which only exceeds by 10 the number given in Petit's catalogue of 1851, in Jour. de Conch. ii, pp. 51-56. My own MS. catalogue of published species contains upwards of 200 species, but an inspection of the actual types would doubtless reduce this number. When we note that Dillwyn's Descriptive Catalogue, published in 1817, names but 18 species belonging to this genus, we have an illustration of the great advance which has been made in our knowledge of the species of mollusca generally, within half a century.



## DESCRIPTIONS OF NEW FOSSIL MOLLUSCA, PRINCIPALLY CRETACEOUS.

BY T. A. CONRAD.

### PACHYCARDIUM, Conrad.

Elevated, thick, cardinal plate broad; ligament deep and oblique; anterior cardinal tooth in the left valve slightly oblique or nearly direct, prominent, compressed, triangular; anterior lateral teeth distant, very prominent, with a pit on the inner side; sculpture, radiating little prominent ribs on the posterior side.

#### P. SPILLMANI, Conrad.

This genus is as easily recognised as *Protocardia*, but, unlike the latter, it contains only two species, both of which existed in the Chalk period, one in Mississippi and the other in India. The Indian species, *C. bisectum*, Forbes, has more numerous ribs, which cover half the surface; but the American shell has fewer ribs, which do not extend so far as the middle of the valves. The former has much more elevated beaks than the latter.

This genus has not been found in any formation later than the Oligocene, and yet one recent shell, *P. Belcheri*, Adams, lives in the Soloo seas, in deep water.

### CARDIUM, Linn.

#### C. RIPLEYANUM, Conrad.—Pl. 9, fig. 6.

*Description*.—Suborbicular, equilateral, ventricose; ribs 21, broad anteriorly, narrow posteriorly, interstices crossed by prominent minute lines.

*Locality*.—Haddonfield, N. J.

### GEMMA? Deshayes.

#### G. CRETACEA, Conrad.—Pl. 9, fig. 19.

*Description*.—Triangular, subequilateral, convex, smooth and



polished; anterior and posterior margins nearly equally oblique; extremities acutely and nearly equally rounded; beaks not prominent or inclined.

*Locality*.—Tippah Co.? Miss.

#### NEMODON, Conrad.

*Description*. Equivalved, thin; hinge line long and straight, or slightly curved under the umbo; hinge in the left valve with three linear teeth parallel with the anterior cardinal margin; posterior lateral tooth double, very long, linear; under the apex a few granular teeth.

N. EUFALENSIS, Conrad.—Pl. 9, fig. 16.

*Description*. Trapezoidal, elongated, thin, contracted from umbo to base; summit obtuse; concentric lines minute and punctate; radiating lines very minute and indistinct; posterior margin oblique, slightly rounded.

*Arca* (*Macrodon*) *Eufalensis*, Gabb.

*Locality*. Haddonfield, N. J.

This genus is related to the older *Macrodon*, Lycett, and to the Eocene *Arca heterodonta*, which Deshayes places in a group of 3 species, under the name *Cucullaries*. I think these 3 species are not representatives of one genus, but of three. *Macrodon* characterizes the Jurassic era, *Nemodon* the Cretaceous, and *Cucullaria*, as represented by *Arca heterodon*, Deshayes, the older Eocene.

*Arca heterodon*, Desh., is a species of this genus, which is exclusively Cretaceous.

#### NEMOARCA, Conrad.

N. CRETACEA, Conrad.—Pl. 9, fig. 21.

*Description*.—Trapezoidal, short, ventricose, subequilateral; ribs 30 as far as umbonal slope, linear, except 3 or 4 nearest to the umbonal slope, which are wider, and one of them grooved; ribs on the anterior submargin and post umbonal area close and minute; hinge line linear, teeth minute, oblique.

*Locality*. Haddonfield, N. J.

This small species more nearly resembles *Striarca*, Conrad, than any other Cretaceous bivalve; but it has the cardinal teeth oblique. There is no internal plate, and the radiating lines are more prominent than in *Trigonarca*. No species of this genus has been found in the Eocene or later Tertiaries.

## TRIGONARCA, Conrad.

T. CUNEIFORMIS, Conrad.—Pl. 9, fig. 1.

*Description.* Trapeziform, inequilateral, elongated, posterior side cuneate; anterior side distinctly radiated; posterior radii very minute, close, obsolete; umbonal slope angulated; post umbonal area depressed, extremity acute; posterior hinge margin oblique.

*Locality.* Haddonfield, N. J.

The smallest species yet known.

## PERRISONOTA, Conrad.

Equivalved, elongated; posterior hinge line long, curved, linear, with numerous close, transverse teeth, extending nearly to the end margin; anterior hinge area broad, oblique and somewhat distant from the hinge margin. No fosset under the apex?

P. PROTEXTA, Conrad.—Pl. 9, fig. 24.

*Description.* Subensiform, smooth, convex; anterior side short, extremity situated nearer the hinge than ventral margin.

*Locality.*—Haddonfield, N. J.

## NUCULARIA, Conrad.

N. PAPYRIA, Conrad.—Pl. 9, fig. 25.

For description see p. 44 of this work. The figure represents a larger specimen, with some variation of form from that on pl. 1, fig. 7.

*Locality.*—Haddonfield, N. J.

## CYPRIMERIA, Conrad.

C. CRETACEA, Conrad.—Pl. 9, fig. 12.

*Dosinia Haddonfieldensis*, Lea., Proc. Acad. Nat. Sci. 1861, p. 149.

This is the only species yet found at Haddonfield, where it is abundant. Young shells are distinctly sculptured over the whole disk with regular concentric lines, but the adult has them only on the umbo, the other lines being those of growth. This species is distinguished by its obtuse front margin, and the elevated or less oblique hinge margins, compared with *C. depressa*, Conrad. The figure in the Journal of the Academy represents the interior; the disk is here figured together with the hinge.

## CAMPTONECTES, Agassiz.

C. ARGILLENSIS, Conrad.—(*Pecten*) Journ Acad. Nat. Sci. 2d series, vol. iv, p. 283, pl. 47, fig. 3.

C. BELLISCUPTUS, Conrad.—Pl. 9, fig. 11.

*Description*.—Ovate, compressed, thin and fragile; divaricating radii distinct; concentric lines extremely thin and minute; interior hinge line crenulated.

*Locality*.—Haddonfield, N. J.

The above description applies to the lower valve. I have not seen the opposite valve.

## SINSYCLONEMA? Meek.

S. SIMPLICIA.—Pl. 9, fig. 20.

The lower valve was represented in the Journ. Acad. vol. iv, pl. 46, fig. 44. The upper valve is here figured. It is remarkable for the prominence of the concentric striæ, and has a few obsolete remote ribs.

*Locality*.—Haddonfield, N. J.

## RADULA, Klein,

R. DENTICUTICOSTA.—Pl. 9, fig. 17 (*Otenoides*) Gabb, Proceed. Acad. Nat. Sci. 1861, p. 327.

The ribs of the shell, when perfect, are sharply and minutely carinated as well as crenulated.

*Locality*.—Haddonfield, N. J.

## TELLINIDÆ.

## METIS, H. and A. Adams.

This genus, which H. and A. Adams place as a subgenus under *Tellinidæ*, is nearly related to *Macoma* by the hinge character, but has a shorter and more ventricose and obtuse form. It is readily recognised by its subequal sides, the broad furrow on the middle of the right valve, and angular fold on the umbonal slope. It occurs in a fossil state, and the following species comprise all that are known to me:

<i>M. biplicata</i> , Conrad ( <i>Tellina</i> ),	} Miocene.
<i>M. medialis</i> , Conrad ( <i>Tellina</i> ),	
<i>M. unda</i> , Conrad ( <i>Tellina</i> ),	
<i>M. tumescens</i> , Dixon, Eocene.	

Mr. Gabb has made a mistake in referring *M. medialis*, Con-

rad, a Miocene fossil, to *M. alta*, Conrad, a recent Californian species. The former is proportionally longer and less ventricose than the latter.

#### MERCENARIA.

*M. PLENA*, Conrad.

*Description*.—Cordate, inequilateral, ventricose, oblique, with close concentric rugose lines; posterior side subcuneiform; lunule ovate; inner margin densely crenulated.

*Locality*.—Eastern Shore, Md. Prof. Cope. Miocene.

I am indebted to Mr. Gabb for this species. It approximates *M. capax*, Conrad, but is shorter, less ventricose, more oblique; the hinge character differs, and the pallial sinus is deeper and more angular.

#### LIROSCAPHA, Conrad.

Beak terminal erect, acute.

*L. SQUAMOSA*, Conrad.—Pl. 9, fig. 23.

*Description*.—Oblong, ventricose, with unequal squamose or spinulose ribs.

*Locality*.—Haddonfield, N. J. Rare.

This is possibly a univalve. It resembles a *Crepidula* externally, but there is no testaceous lamina within. It may be related to *Thylacus*, Conrad, figured in the Journal of the Academy, vol. iv, pl. 46, fig. 22.

#### CANCELLARIA, Lam.

*C. SUBALTA*, Conrad.—Pl. 9, fig. 22.

*Description*.—Elevated; whorls 6, convex, first three smooth; sculpture prominent; rather close longitudinal ribs crossed by smaller lines, about 12 on the last whorl; these lines more distant between the suture and shoulder; labrum angulated above the middle, thickened, strongly toothed on the inner margin; base slightly produced.

*Locality*.—Haddonfield, N. J.

#### EULIMA, Risso.

*E. CRETACEA*, Conrad.—Pl. 9, fig. 15.

*Description*.—Subulate, whorls 11? slightly truncated at base, except the last volution, which is subangular or acutely rounded medially.

*Locality*.—Haddonfield, N. J.

Distinguished by the whorls of the spine suddenly curved inwards above the suture.

GADUS, Rang.

G. OBNUTUS, Conrad.—Pl. 9, fig. 18.

*Description*.—Slightly curved, gradually tapering above, more suddenly towards the mouth, which is small.

*Locality*.—Haddonfield, N. J.

CARDITAMERA, Conrad.

C. MACROPLEURA, Conrad.

*Description*.—Trapezoidal, ventricose; large, prominent, flattened on the surface, crossed by prominent lines; ribs 13, gradually increasing in size from the anterior extremity to the umbonal slope; the adjoining post-umbonal rib large, but smaller than the umbonal, and between it and the dorsal line are 3 small or slender ribs, the marginal one thickest; posterior margin obliquely truncated; umbo broad.

*Locality*.—Virginia.

SAXCICAVA, Lam.

S. INCITA, Conrad.

*Description*.—Trapezoidal, inequilateral, convex, with minute concentric lines; posterior end obliquely truncated, biangulated; beaks distant from the anterior margin.

*Locality*.—E. shore, Maryland.

CYPRINOPSIS, Conrad.

Equivalve; two anterior cardinal teeth, and one very oblique bifid tooth in the right valve. Pallial line entire.

Type.—*Artemis elliptica*, Smith, Journ. Geolog. Soc. vii, pl. 15, figs. 2, 3.

*Meretrix ovalis*, Gabb, Palæont. Calif. Cretaceous.

This genus is nearly related to *Cyprina*, but the two subequal anterior cardinal teeth of the right valve sufficiently distinguish it. It has also a much narrower posterior tooth, bifid, not trilobed or broadly channelled as in *Cyprina*.

PALÆOCORBIS, Conrad.

Equivalve; hinge with a pit under the beak of the left valve, and an obtuse anterior thick cardinal tooth; an anterior thick

lateral tooth in each valve, in the left valve excavated; posterior lateral teeth in the left valve 3, parallel with the cardinal line; pallial line entire; anterior side gaping.

*Corbis cordiformis*, D'Orbigny. Cretaceous.

This genus differs essentially from *Corbis*, Cuv., in the arrangement of the hinge teeth, and is not of earlier date than the Necomian Cretaceous. This fossil is common in Egypt as well as France.

Whether *Corbis rotundata*, D'Orbigny, is a member of this genus is doubtful, as the hinge character differs.

### *Triassic.*

#### SOLEMYA.

S. TRIASINA, Conrad.

*Description*.—Oval, extremely thin; end margins subequal and obtuse. Length  $1\frac{3}{4}$  inch. Height 1 inch.

*Locality*.—Near Perkiomen Creek, Penn.

This cast, with portions of the shell remaining, is in a dark, hard slate colored shale. Traces of the extra marginal perios-traca are seen in plications on the stone. Plications are also visible on the posterior side near the extremity on one valve, and other obtuse folds may be the result of pressure on a very thin shell.

My apology for describing this obscure cast is that organic remains, especially shells, are comparatively few in the Triassic rock of Pennsylvania, and I wish to call attention to this bivalve that better specimens may be searched for by collectors and naturalists.

#### DONAX, Linn.

D. FORDII, Conrad.—Pl. 9, fig. 27.

*Description*.—Triangular, inequilateral, ventricose; extremities acutely rounded; radiated by minute, close impressed lines, near the posterior ventral margin a few concentric lines are crenulated by the junction with the radiating lines.

*Locality*.—Haddonfield, N. J. Mr. J. W. Ford.

#### ERYCINELLA, Conrad.

*Woodia laevigata*, Speyer, is a species of this genus.

*Reference*.—Dunker's Palæont. pl. 30, fig. 8.



## SOLEMYA, Lam.

## S. VENTRICOSA, Conrad.

The external form and the rays indicate this shell to be a true *Solemya*, where it must remain until the hinge has been seen. Mr. Gabb refers it to *Siliqua patula*, Dixon, but it differs greatly in form, being highest posteriorly, and especially varies by the rayed posterior lines, and it is besides an extinct species.

## NOTES ON RECENT MOLLUSCA.

BY T. A. CONRAD.

## PLEIODON MACMURTREI, Conrad.

Swainson's original Latin description of *Iridina ovata* reads "testâ lævi, transversim ovata," but his translation reads "transversely oval." The form of the shell known as *I. ovata* is neither the one nor the other; it is elliptical, whilst the *P. Macmurtrei* is perovate. Swainson says the umbones are placed nearly in the middle of the hinge margin, in his species, but in the former they are much nearer the anterior extremity. It has been suggested that our shell has received an injury, but this is a slight deformity of a portion of the ventral margins. The broad and prominent umbo, ovate and shorter form distinguish it from *P. ovata*, independent of any accident.

*P. ovatus*, Adams, Genera pl. cxix, fig. 2, is a species distinct from either of the above mentioned, and probably undescribed.

## BUSYCON CARICA, Lam.

By some unexplicable oversight the name of *Murex aruana*, Rumphius, 1705, was applied by me to *B. carica*. Linné's first reference to a figure is that of *Murex aruana*, Rumphius, but his description and second reference to a figure in *Gualtieri* apply to *B. carica*. This singular error is continued in several editions of Syst. Nat.

*B. gibbosum*, Con., is erroneously given a synonym of *B. Kieneri*. It should stand thus:

B. ELICEANS, Montfort. *B. gibbosum*, Con.

## CONUS, Lin.

## C. STEARNSII, Conrad.—Pl. 10, fig. 1.

*Description*.—Subfusiform; sides nearly straight; spire elevated, acute, longitudinally wrinkled; sides nearly rectilinear,

or slightly concave; volutions slightly carinated at base; angle of body whorl carinated; 10 revolving impressed lines on the body whorl; color bluish brown above on the body whorl, with revolving series of whitish spots and a brown dot between each of the lighter ones; carina of body whorl marked by a series of distant brown spots; lower part of body whorl yellowish, clouded with a series of brown dots on the ridges between the impressed lines; spire yellowish and brown spotted; labrum slightly sinuous, spotted within.

*Locality*.—Oyster Bar, Pine Key, W. coast Florida. R. E. C. Stearns.

This little shell belongs to a group of cones with elevated spires, characteristic of the central Pacific and Atlantic coasts. Mr. Stearns obtained 5 specimens, of which some were alive, on Oyster Bar, in a small bayou at Pine Key; also on the beach of mainland back of Long Key.

#### CARDIUM NUTTALLII, Conrad.

Mr. Carpenter makes this name a synonym of *C. corbis*, Meusch, or of Martyn. I have not seen the description, but I make a comparison of *Nuttallii* with the figure given by Martyn:

*C. corbis*.—35 large ribs, with an intermediate smaller rib between most of them.

3 wide ribs on posterior slope.

Ligament narrow.

*Locality*.—Pooloo Condor—tropical China seas.

*C. Nuttallii*.—Large ribs 28; no intermediate rib.

6 close narrow ribs on posterior slope.

Ligament very wide.

Narrower and much more prominent beaks.

*Locality*.—Upper California.

#### CAPULUS, Mont.

C. SHREEVEI, Conrad.—Pl. 13, fig. 3.

*Description*.—Elevated, profoundly curved, compressed; back flattened, traces of longitudinal lines near the base, margins angular.

*Locality*.—Long Island, S. Carolina.

This curious shell is only provisionally referred to *Capulus*, as it is not sufficiently perfect to classify without some doubt of its generic character.

It was found by a young student of conchology, Miss Lizzie Shreeve, to whom I dedicate it.

## UROSALPINX, Stimpson.

U. FLORIDANA, Conrad.—Pl. 12, fig. 4.

*Description*.—Fusiform, longitudinal ribs distant, prominent, thick, rounded; spire prominent, scalariform; whorls 6, penultimate whorl with 3 prominent revolving lines; last volution profoundly ribbed and having 10 conspicuous prominent revolving lines; caudal ridge prominent, curved; beak recurved, longitudinal prominent wrinkled lines are conspicuous over the whole surface; aperture and columella purple; labrum with 7 lines within.

*Locality*.—Tampa Bay, Florida.

This shell somewhat resembles *Murex craticulatus*.

It is rough, cinereous in color, and the lower part from labrum summit to extremity of siphonal canal is three-tenths of an inch longer than from the summit of labrum to apex.

## RANELLA, Lam.

*S. Gen.* EUPLERA, H. and A. Adams.

R. TAMPÆNSIS, Conrad.—Pl 12, fig. 5.

*Murex Tampæensis*, Conrad, Proceed. Acad. Nat. Sciences, vol. iii, 1846, p. 25.

## BUSYCON, Mont.

B. ELICEANS, Mont.

Mr. R. E. C. Stearns has presented to the Academy a fine adult specimen from Florida and a young shell, which, compared with a specimen of *carica* of about the same stage of development, presents the following differences: thicker than *carica*, the spines larger in front, but suddenly becoming very thick, distant and profoundly elevated on the back, whilst in the *carica* they continue of a comparatively very small size. The color of *eliceans* is bright reddish brown, having a tinge of purple, with a broad white columella. The columella of *carica* is striated and has dark purple lines, whilst the general color of the markings is purple black. The lines of distinction between *eliceans*, *carica*, *Kieneri*, *perversum*, *coarctatum* and *candelabrum* are strongly defined. If *B. carica* and *B. perversum* are one species, how is it that *perversum* should be abundant in Florida and unknown on the coasts of the Middle and Eastern States, where *carica* abounds? The *perversum* attains a far larger size than *carica*; indeed I have never seen an adult specimen of the latter among Florida shells, nor did I see a specimen of any kind during the two months I was collecting on the southern coast of Florida.

*B. cliveans* is well represented in Reeve's figure, Mon. species 16, which is misnamed *Pyrula aruanum*, and also in Chenu's figure with the same name. Manual, vol. ii, p. 180.

For good figures of *B. carica*, see Encyc. Method. pl. 433, fig. 3; Lister, t. 880, fig. 3; Gaulteri, pl. 47, fig. B.

#### MODULUS, Gray.

*M. FLORIDANUS*, Conrad.—Pl. 12, fig. 6.

*Description*.—Suborbicular, whorls 5, channelled at the suture; penultimate and last volutions with transverse nodular ribs; a revolving rib at the base of the whorls of the spire, slightly nodular and continued on the last volutions below the transverse ribs; shoulder rounded; revolving ribs of last whorl 8, rounded, slightly nodular; white, with black spots; columellar tooth oblique, perfectly straight, tinged with purple; umbilicus small; columella concave, purple; operculum round, concave.

*Locality*.—Florida.

This pretty species is smaller than *M. lenticularis*, Chemn., and differs most obviously in having a rounded shoulder, more numerous and smaller transverse ribs, and a round operculum. The last whorl has conspicuous transverse wrinkled lines between the ribs. The transverse ribs are small and numerous, and become obsolete towards the aperture on the last volution. It may possibly be a variety of *M. unidens*, Lister.

#### CYRENA.

*C. PROTEXTA*, Conrad.—Pl. 12, fig. 3.

*Description*.—Longitudinally cuneiform, very inequilateral, thin in substance, elongated, anteriorly ventricose, posteriorly folded or contracted from the umbonal margin, behind the apex, obliquely to ventral margin, which is emarginate in that part; posterior extremity narrowed and obtusely rounded; prominent concentric lines on the umbo; summit prominent, color white, tinged with brown towards the posterior ventral margin and posterior extremity; within white, dark purple towards the posterior end.

*Locality*.—Tampa Bay.

This species is longer than *C. Floridana*, and may be readily distinguished by its whitish exterior and posterior dorsal line straight to the extremity, as well as by its longer outline, more prominent beaks, and less ventricose form. The pallial line has a very short, sharply angular sinus. Several living specimens were obtained by Mr. Stearns.

## MODIOLARIA, Beck.

Young specimens of *M. lateralis*, Say, were obtained by Mr. Stearns at Point Penallis and Rocky Point, Tampa Bay.

## ANOMALOCARDIA, Klein.

A. FLORIDANA, Conrad.—Pl. 13, fig. 2.

*Description*.—Elongated, rhomboidal, ventricose, inequilateral, beaks remote; summit very prominent and broad, slightly flattened; umbonal slope rounded, undefined; ribs 29 to the umbonal slope, narrow, flattened, grooved in the right valve; in the left valve the medial ribs are entire; fine, regular waved concentric lines cover the whole disks; periostraca brown and woolly; cardinal line straight; teeth small and numerous.

*Locality*.—Long Key, Gulf of Mexico; Galveston, Texas. R. E. C. Stearns.

A long white species, allied to *A. secticosta*, Reeve, but proportionally less elevated, with fewer ribs; the muscular impressions are barely visible.

## HARVELLA, Gray.

H. PACIFICA, Conrad.—Plate 12, fig. 2.

For description, see Am. Jour. Conch. iii, p. 192.

## SPISSULA, Gray.

S. CATILLIFORMIS, Conrad.—Plate 13, fig. 1.

For description, see Am. Jour. Conch. iii, p. 193.

S. DOLABRIFORMIS, Conrad.—Plate 12, fig. 1.

For description, see Am. Jour. Conch. iii p. 193.



DESCRIPTIONS OF NEW SPECIES OF TERRESTRIAL MOLLUSCA FROM THE ANDAMAN ISLANDS, INDIAN ARCHIPELAGO.

BY GEO. W. TRYON, JR.

The small collection of shells from the above locality I believe are almost the only specimens of the Mollusca of the Andamans which have been seen by any naturalist, as I cannot discover any species attributed to these islands in the various monographs.\* In view of this fact, and of the isolation of these islands, we may rationally conclude that most of the shells which may be discovered there hereafter will be peculiar to them and new to science.

The Andaman Islands are a densely wooded group, situated in the lower part of the Bay of Bengal, nearly two hundred miles south-west of Cape Negrais, and about the same distance north of the Nicobar Islands. They are scantily populated by barbarous tribes. Area about 3000 square miles. A British naturalist, Dr. Helfer, lost his life, a few years ago, from an attack of the natives while endeavoring to investigate their natural history. The mollusca are of course of Indian types.

1. RHYSOTA (*Helix*) CHAMBERTINII, Tryon.—Pl. 10, fig. 2.

*Description*.—Shell turbinately depressed, rather solid, whorls five, convex, with deep sutures, the last whorl slightly angulate on the periphery. Surface marked with rugose growth lines, decussated by numerous close undulating revolving striae. Aperture oblique, oval; lips simple, thickened near the narrow umbilicus. Color chestnut brown, white within.

*Dimensions*.—Diam. 31, alt. 21, mill.

\* The only conchological mention of the islands is in a paper by Mr. W. H. Benson (Annals and Mag. Nat. Hist. 3d ser. vi, 190, 1860), containing descriptions of *Helix Helferi*, *Streptaxis Andamanica*, and *Helicina Andamanica*, and in the Mal. Blätter is the description of a *Helix* from the same locality.

Belongs to the group of which *H. ovum*, Val., *H. rhea*, Pfr., and other well known large species are members.

Named in honor of Capt. W. B. Chambertin, British Army.

2. AMPELITA (*Helix*) BIGSBYI, Tryon.—Pl. 10, fig. 3.

*Description*.—Shell depressed trochiform, solid, acutely carinate at the periphery; whorls five, flat above, convex beneath, with well impressed sutures. Surface marked by close slight growth lines; color chestnut, without bands; aperture rhomboidal, with white, thickened, reflected lip, partly covering the narrow umbilicus.

*Dimensions*.—Diam. 25, alt. 15, mill.

Much resembles *H. unicolor*, Pfr., but that species is somewhat larger, and the margin of the aperture is chocolate colored.

Named after J. J. Bigsby, M.D., a zealous American naturalist and collector.

3. OROBIA (*Helix*) ANDAMANENSIS, Tryon.—Pl. 10, fig. 4.

*Description*.—Shell depressed, thin above, thicker below, shining, with impressed sutures and growth lines; spire but slightly elevated; whorls five, the last one slightly angulate at the periphery, and more convex below; aperture lunate; lip simple, acute, slightly reflected over the minute perforation. Light corneous.

*Dimensions*.—Diam. 12, alt. 6, mill.

Resembles *H. vitrinoides*, Desh., but is a smaller species, with one less whorl, more convex above, the sutures not margined, and the striæ of growth more distinct.

PLECTOPYLIS (*Helix*) ACHATINA, Gray.

Somewhat smaller, but does not otherwise differ from Indian examples, either externally or in its armature.

4. OPEAS (*Bulimus*) PEALEI, Tryon.—Pl. 10, fig. 5.

*Description*.—Shell turreted, elongate, slender, rather solid; whorls eight, flatly convex; suture slight; apex papillary; aperture ovate, small; lip simple; columella perpendicular, forming an angle with the lip at the base. Light greenish horn color, white within.

*Dimensions*.—Length 35, diam. 9, mill.

Resembles *Bul. elongatulus*, Pfr., but may be distinguished

from it by the whorls being less convex and the columella straight instead of incurved.

Named after Mr. C. W. Peale, of Philadelphia, a gentleman much interested in conchology.

5. ? CYCLOSTOMA LEAI, Tryon.—Pl. 10, fig. 6.

*Description*.—Shell globosely conic, narrowly umbilicate; whorls five, convex, closely spirally striated; aperture oval; lip slightly reflected. Epidermis light brown, crossed by zigzag darker flames, which are most apparent below the sutures. Operculum?

*Dimensions*.—Diam. 16, alt. 19, mill.

HELICINA NICOBARICA, Phil.

Two specimens which I have carefully examined appear to belong to this species, although the colored band is very indistinct in one individual and not visible in the other. Mr. Sowerby (Thes. Conch. iii, t. 276, f. 381, 382) has confounded *H. Andamanensis*, Benson, with this species, but *Andamanensis* is much larger and, I think, distinct.

SCARABUS TRIGONUS, Troschel.

NOTICES AND REVIEWS  
OF  
NEW CONCHOLOGICAL WORKS.

BY GEO. W. TRYON, JR.

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I.—AMERICAN.

**Proceedings of the Portland Society of Natural History.** Vol. 1.  
Part 2, 1869.

*The Clio borealis on the coast of Maine.* By DR. W. WOOD.

This rare arctic visitant of our shores was detected at Portland from the beginning of April until May 7th, 1868. Its appearance is described to the unusual severity of the season. There is no record of its occurrence in our waters previously since 1833, when it was observed in the vicinity of New York.

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**Observations on the genus *Unio* ; together with Descriptions of new species in the family Unionidæ, and Descriptions of new species of the Melanidæ and Paludinæ.** By ISAAC LEA, L.L.D. Vol. xii.  
(With 26 plates). 1869.

*Twelve* volumes almost entirely devoted to the description and illustration of new species in a single family of fluviatile mollusca ! Over forty years of the life of a gentleman of liberal culture—an active and successful business man withal—almost unremittingly devoted to the study of fresh-water clams ! The general public still scoff and cry *cui-bono* ? and men with a smattering of science admit the service done by Dr. Lea as a contribution of facts to the sum of human knowledge, but object that he has ridden his hobby entirely too hard, and has made species where there are no differences. It is unfortunate for Dr. Lea's popular reputation that these critics have not a better

acquaintance with his subject, but it is a fact that not one professed conchologist in fifty understands the true specific characters of the Unionidæ! It is only the very few who are initiated that can fairly estimate the great value of Dr. Lea's writings, and properly appreciate the grandeur of this monumental work.

The species described in Vol. 12 have already been enumerated by me in noticing the Proceedings of the Philadelphia Academy where they were first published. They are principally of the United States, although a goodly number are from South and Central America and Asia Minor. The illustrations of course are very accurate and of the highest artistic merit; indeed nothing inferior in this way would be tolerated by the author, whose careful supervision of all the mechanical details has rendered his volumes in all respects models of accuracy and beauty.

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## II.—FOREIGN.

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### BRITISH.

**Zoological Record**, iv. 8vo. London, 1868.

Pages 485-602 of this valuable work contains the review of Conchological literature for the year 1867, by Dr. Edw. von Martens. The work as usual, is very thoroughly done:—first the titles of all separate works as well as papers in zoological journals are given, next follow the faunas, and finally the mollusca are reviewed by families.

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### FRENCH.

**Nouvelles Miscellantes Malacologiques.** By M. PALADILHE. Parts 2 and 3. 8vo. Paris, 1867-8.

These papers have been noticed by me already, upon their first publication in the "Revue et Magasin de Zoologie," the above title being adopted by the author for his extra copies. There are several lithographic plates.

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**Revue et Magasin de Zoologie.** 1869. No. 1.

*Descriptions d'espèces nouvelles du genre Pomatias, suivies d'un Aperçu synonymique sur les espèces de ce genre.*  
By ALFRED DE SAINT-SIMON.

- P. Bourguignati*, Pyrennees.      *P. Paladilhianus*, Sicily.  
 " *Benoitii*, Sicily.                " *Hispanicus*, Bourg. Spain.  
 " *protractus*, Parreyss. Sicily,    " *Mabillianus*, Pyrennees.  
 " *Ashenarum*, Greece.                " *Hellenicus*, Greece.

A synonymical list of the known species is annexed.

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**Actes de la Societe Linneenne de Bordeaux.** xxvi. Part 4. Mar. 1868.

*Note sur le Limnea variabilis Millet et le Limnea glabra,*  
*Var. 8, variabilis, Moq.-Tand.* By ABBE LUD. BARDIN.

*De la Classification de certains opercules de Gastéropodes.*  
 By CHAS. DESMOULINS.

This paper I have already noticed from the separate copy forwarded by the author.

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**Journal de Conchyliologie.** ix. No. 2. Paris, April, 1869. 96 pp. with three colored and one plain plates.

*Note sur la distribution géographique des Brachiopodes aux Antilles.* (2d article). By H. CROSSE et P. FISCHER.

*Note sur la faune malacologique marine de l'île d'Elbe.* By A. MANZONI.

*Note sur la natation du Pecten maximus.* By P. FISCHER.

*Observations sur les principaux caractères de la faune Malacologique terrestre du Brésil.* By A. D. BROWN.

*Note sur la provenance exacte de l'Helix Cambojeensis, Reeve.*  
 By F. DANIEL.

*Sur la synonymie du Loligo vulgaris, Lamarek.* By P. FISCHER.

*Monographie de la famille des Realicea, Pfeiffer.* By WM. HARPER PEASE.

A very valuable catalogue of a family but little known by most of our conchologists—the species being principally of recent description.

*Liste des espèces supposées appartenir au genre Assiminea de Leach.* By W. H. PEASE.

*Omphalotropis macula*, Martens, and *O. fulvida*, Pfr., and *Hydrocena fasciolata*, Morelet, are all synonyms of *A. carinata*, Lea.

*A. lucida*, Pease, n. sp. Isl. Annaa.



*Description d'espèces nouvelles du genre Helicter, habitant les îles Hawaïi.* By W. HARPER PEASE.

<i>Leptachatina cylindrata</i> ,	<i>Labiella pachystoma</i> ,
“ <i>brevicula</i> ,	“ <i>compacta</i> ,
“ <i>tenuicostata</i> ,	<i>Amastra porphyrostoma</i> ,
“ <i>simplex</i> ,	“ <i>solida</i> ,
<i>Partulina compta</i> ,	<i>Laminella erecta</i> .

*Diagnoses Molluscorum Novæ Caledoniæ incolarum.* By H. CROSSE.

<i>Turbinella Mariei</i> ,	<i>Bulimus scarabus</i> , Albers, var.
<i>Cithara Richardi</i> ,	“ <i>Ouveanus</i> , Dotzauer,
“ <i>delacouriana</i> ,	<i>Neritina nucleolus</i> , Morelet.
<i>Pleurotoma Mariei</i> ,	<i>Bulimus Alexander</i> .

*Note sur deux monstruosités remarquables de l'Helix pomatia, et sur deux Paramacella de France.* By PAUL GERVAIS.

*Diagnoses Molluscorum novorum.* By H. CROSSE.

<i>Murex Pazi</i> , Antilles.	<i>Bulimus Aristæus</i> , Equador.
<i>Helix Cyrene</i> , Oceania.	<i>Pupa gubernatoria</i> , Bahamas.
“ <i>Cymodoce</i> , “	<i>Pterocyclas</i> ? <i>Eudædaleus</i> , Borneo.
<i>Bulimus longurio</i> , Chili.	<i>Helicina mitochila</i> .
“ <i>Corydon</i> , Equador.	<i>Ostrea Pauluccia</i> .

*Diagnoses Molluscorum novorum*, By J. G. HIDALGO.

*Bul. semipictus*, Equador. *Bul. Bæzensis*, Equador.

*Diagnoses Molluscorum novorum rei publicæ Mexicanæ.* By H. CROSSE and P. FISCHER.

<i>Tebennophorus Sallei</i> .	<i>Berendtia</i> , n. g.
<i>Streptostyla Botteriana</i> .	Type <i>Balea Taylora</i> , Pfr.(= <i>Cylindrella</i> , ( <i>Urocoptis</i> ) <i>Newcombiana</i> , Gabb.)

*Observations critiques sur quelques Paludines de l'Indo-Chine.* By ARTHUR MORELET.

*P. Ingallsiana*, of Reeve, Martens, and Frauenfeld, but not of Lea, is made a new species, *P. Frauenfeldi*.

*P. trochoides*, Martens. *P. umbilicata*, Reeve non Lea, is a synonym.

*P. Eyriesii*, Morelet, *P. Fischeriana*, Mab. et Le Mesle, is a synonym.

*P. Sumatrensis*, Dunker, *P. polygramma*, Martens, *P. lineolata*, Frauenfeld and Mousson, and *P. filosa*, Hanley, are synonyms.

*Bibliographie, Nouvelles.*

## GERMAN.

**Verhandlungen der Kaiserlich-Königlichen Zoologisch-botanischen Gesellschaft in Wien.** Vol. xviii. Vienna, 1868.

*Zoologische Miscellen.* By GEORG RITTER von FRAUENFELD.

(*Helix*) *Campylæa Styriaca.*

*Beiträge zur Fauna der Nicobaren.* By GEORG RITTER von FRAUENFELD. (Contains a list of species.)

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**Archiv für Naturgeschichte.** 34th year. Part 4th. Conducted by Dr. F. H. TROSCHEL. 1868.

The conductor reviews at length the Conchological literature published during the year 1867.

# CATALOGUE

## OF THE RECENT SPECIES OF THE

# FAMILY CORBICULADÆ.

BY TEMPLE PRIME.

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### Family **CORBICULADÆ**, Gray.

Proc. Zool. Lond. xv, 184, 1847.

*Les Conques* (ex parte), Lamarck, Lam. Phil. Zool. i, 318, 1809.

*Les Conques fluviatiles*, Lamarck, Lam. An. v, 556, 1818.

*Veneriade*, Leach, in litt. 1818.

*Cycladia*, Rafinesque, Ann. Gen. Sci. Phys. et Nat. v, 1820.

*Les Cyclades*, Férussac, Tab. Syst. 43, 1822.

*Cycladina*, Latreille, Fam. Nat. 218, 1825.

*Cyclade*, Fleming, Hist. Brit. An. 409, 1828.

*Cycladæa*, Deshayes, Encycl. Méth. 1830.

*Cyrenide*, Gray, Synop. Brit. Mus. 75, 91, 1840.

*Cycladacea*, Hinds, Voy. Sulph. 66, 1844.

*Cyclaside*, D'Orbigny, Voy. 566, 1846.

### GENUS **CORBICULA**, Megerle.

Mag. Gesell. Naturf. Berl. v, 56, 1811.

*Tellina* (pars), Müller, Verm. ii, 205, 1774.

*Venus* (pars), Chemnitz, Martini et Chemnitz vi, 320, 1782.

*Cyclas* (pars), Bruguière, Encycl. Méth. 1792.

*Cyrena*, Lamarck, Lam. An. v, 552, 1818.

*Venulites*, Schloth, Petref. 200, 1820.

1. **Corb. Africana**, Deshayes.  
*Cyrena Africana*, Krauss, Moll. S. A. 8, pl. 1, f. 8, 1848.  
*Cyrena Gauritziana*, Krauss, in litt. 1848.  
*Corbicula Africana*, Deshayes, Brit. Mus. Cat. Conchif. 222,  
 1854. Prime, Cat. Corb. 4, 1863. Ann. Lyc. N. H.  
 N. Y. viii, 224, f. 57, 1866. *Cape of Good Hope, Africa.*
2. **Corb. Agrensis**, Prime.  
*Cyrena Agrensis*, Kurr, in litt.  
*Corbicula Agrensis*, Prime, Proc. Ac. N. S. Phila. 128, 1861.  
 Prime Cat. Corb. 3, 1863. Ann. Lyc. N. H. N. Y. viii.  
 75, f. 24, 1864. *Agra, India.*
3. **Corb. ambigua**, Deshayes, Proc. Zool. Lond. xxii, 345,  
 1854.  
 Brit. Mus. Cat. Conchif. 223, 1854. *R. Euphrates.*
4. **Corb. Amazonica**, Anthony, Ann. Lyc. N. H. N. Y. ix,  
 1869. *Rio Amazon.*
5. **Corb. amiralis**, Prime, Ann. Lyc. N. H. N. Y. ix, 1869.  
*Cochin China.*
6. **Corb. Angasi**, Prime, Cat. Corb. 4, 1863.  
 J. Conchyl. xii, 151, pl. vii, f. 6, 1864.  
*Murray River, S. Australia.*
7. **Corb. Astartina**, Martens.  
*Cyrena Astartina*, Martens, Malak. Bl. vi, 219, pl. iii, f. 6, 7,  
 1859. *Lake Nyassa, Africa.*
8. **Corb. Australis**, Deshayes.  
*Cyclas Australis* (exclus. var.), Lamarck, Lam. An. v, 560,  
 1818.  
*Cyrena Australis*, Deshayes, Wood Index Test. Suppl. 2, pl.  
 xiv. f. 57, 1828. Encycl. Meth. ii. 50, 1830. Lam. An.  
 Desh. ed. vi, 270, 1835.  
*Corbicula Australis*, Deshayes, Brit. Mus. Cat. Conchif. 230,  
 1854. Prime, Cat. Corb. 4, 1863. *Island of Timor.*
9. **Corb. baronialis**, Prime, Ann. Lyc. N. H. N. Y. ix, 1869.  
*Moreton Bay, Australia.*
10. **Corb. Bengalica**, Deshayes, Proc. Zool. Lond. xxii, 344,  
 1854.  
 Brit. Mus. Cat. Conchif. 224, 1854. Prime, Cat. Corb. 4,  
 1863. Ann. Lyc. N. H. N. Y. viii, 220, f. 52, 1866.  
*Bengal.*
11. **Corb. Bensonii**, Deshayes, Proc. Zool. Lond. xxii, 345,  
 1854.  
 Brit. Mus. Cat. Conchif. 223, 1854. *Bengal.*

12. **Corb. Blandiana**, Prime, Ann. Lyc. N. H. N. Y. viii, 71,  
f. 18, 1864. *Laos Mountains, Cambodia.*
13. **Corb. Bocourti**, Morelet, I. Conchyl. xiii, 228, 1865.  
*Cochin China.*
14. **Corb. borealis**, Prime.  
(*Venus borealis*, Chemnitz, Martini et Chemnitz, vii, 26, pl.  
xxxix, f. 412, f. 414, 1784)?  
*Cyclas*, Encycl. Méth. pl. 302, f. 3, 1792.  
*Cyclas borealis*, Lamarck, Ann. Mus. Hist. Nat. vii, 421  
1806.  
*Cyrena depressa*, Lamarck, Lam. An. v, 553, 1818.  
*Hab.—?*
15. **Corb. Brasiliana**, Deshayes, Brit. Mus. Cat. Conchif. 232,  
1854.  
Smith. Inst. Misc. Coll. Prime, Monog. Corb. 7, 1865.  
*Brazil.*
16. **Corb. brunnea**, Prime, Proc. Ac. N. S. Phila. 126, 1861.  
Prime, Cat. Corb. 3, 1863. Ann. Lyc. N. H. N. Y. viii,  
67, f. 13, 1864. *Tasmania.*
17. **Corb. castanea**, Morelet, J. Conchyl. xiii, 228, 1865.  
*Cochin China.*
18. **Corb. Cashmiriensis**, Deshayes, Proc. Zool. Lond. xxii,  
344, 1854.  
Brit. Mus. Cat. Conchif. 224, 1854. *Cashmere.*
19. **Corb. Chemnitziana**, Prime, Ann. Lyc. N. H. N. Y. viii,  
60, f. 5, 1864. *China?*
20. **Corb. colonialis**, Prime, Ann. Lyc. N. H. N. Y. viii, 416,  
1867. *Java.*
21. **Corb. compressa**, Deshayes.  
*Cyrena compressa*, Mousson, in litt.  
*Corb. compressa*, Deshayes, Brit. Mus. Cat. Conchif. 227, 1854.  
*Java.*
22. **Corb. consanguinea**, Prime, Ann. Lyc. N. H. N. Y. viii,  
417, 1867. *India.*
23. **Corb. consobrina**, Deshayes.  
*Cyrena consobrina*, Cailliaud, Voy. ii, 263, pl. lxi, f. 10, 11,  
1826.  
*Cyclas consobrina*, Cailliaud, Cat. and Reeve, Nomencl. 29,  
1845. *River Nile.*
24. **Corb. consularis**, Prime, Ann. Lyc. N. H. N. Y. ix,  
1869. *Malacca.*

25. **Corb. convexa**, Deshayes, Proc. Zool. Lond. xxii, 342, 1854.  
 Brit. Mus. Cat. Conchif. 231, 1854.  
*Corbicula ventricosa*, Prime, in litt.  
*Corbicula convexa*, Deshayes, Prime, Cat. Corb. 3, 1863.  
 Smith. Inst. Misc. Coll. Prime Monog. Corb. 3, f. 1, 1865. *Central America and Mexico.*
26. **C. cor**, Deshayes.  
*Cyrena cor*, Lamareck, Lam. An. v, 552, 1818. Delessert, Recueil, pl. vii, f. 7, 1841.  
*Corbicula cor*, Deshayes, Brit. Mus. Cat. Conchif. 221, 1854.  
 Ann. Lyc. N. H. N. Y. viii, 63, f. 8, 1864. *East Indies.*
27. **C. crassula**, Mousson. Mousson, Bellardi, Cat. 54, f. 12, 1854.  
 Prime, Cat. Corb. 3, 1863. Ann. Lyc. N. H. N. Y. viii, 216, f. 54, 55, 1866. *Syria.*
28. **C. Crosseana**, Prime, Ann. Lyc. N. H. N. Y. viii, 72, f. 20, 1864. *Philippine Islands.*
29. **C. Cumingii**, Deshayes, Brit. Mus. Cat. Conchif. 228, 1854.  
*Corbicula squalida*, Deshayes, Proc. Zool. Lond. xxii, 342, 1854. Brit. Mus. Cat. Conchif. 233, 1854.  
*Corbicula notata*, Prime, Proc. Ac. N. S. Phila. 127, 1861.  
*Corbicula Cumingii*, Deshayes, Prime, Cat. Corb. 4, 1863.  
 Ann. Lyc. N. H. N. Y. viii, 217, f. 46—49, 1866. *Philippine Islands.*
30. **C. cuneata**, Deshayes.  
*Cyrena cuneata*, Jonas, Zeit. Malak. 186, 1844. Philippi, Abbild. Conch. ii, 77, pl. 1, f. 6, 1846.  
*Cyrena globulus*, Jonas, in litt.  
*Corbicula incrassata*, Deshayes, Proc. Zool. Lond. xxii, 342, 1854.  
*Corbicula cuneata*, Deshayes, Brit. Mus. Cat. Conchif. 231, 1854. Prime, Cat. Corb. 3, 1863. Smith. Inst. Misc. Coll. Prime Monog. Corb. 6, f. 5, 1865. *Orinoco River, South America.*
31. **C. Cyrænopsis**.  
*Cyclas Cyrænopsis*, Valenciennes.  
*Cyclas*, Encycl. Méth. pl. 301, f. 3, 1792. *Hab.—?*
32. **C. Cyreniformis**, Prime, Proc. Zool. Lond. xxviii, 321, 1860.  
 J. Conchyl. ix. 41, pl. ii. f. 5, 1861. *Hab.—?*



**33. C. debilis**, Deshayes.

*Cyrena debilis*, Gould, Proc. Soc. N. H. Bost. iii, 293, 1850.  
U. S. Explor. Expedit. xii, 427, pl. xxxvi, f. 529, a. b.  
1852.

*Corbicula debilis*, Deshayes, Brit. Mus. Cat. Conchif. 234,  
1854. *Hunter River, New Holland.*

**34. C. Delessertiana**, Prime, Ann. Lyc. N. H. N. Y. ix,  
1869. *Egypt and Smyrna.***35. C. difficilis**, Prime, Cat. Corb. 4, 1863.

Ann. Lyc. N. H. N. Y. 62, f. 7, 1864. *North Africa?*

**36. C. ducalis**, Prime.

*Cyrena fluminea*, Mousson, Philippi, Abbild. Conch. ii, 76,  
pl. 1, f. 3, 1847. Moll. Java, 87, pl. xx, f. 3, 1848.

*Corbicula ducalis*, Prime, Proc. Soc. N. H. Bost. viii, 274,  
1862. Prime, Cat. Corb. 4, 1863. Ann. Lyc. N. H.  
N. Y. viii, 225, f. 58, 1866. *Java.*

**37. C. episcopalis**, Prime, Ann. Lyc. N. H. N. Y. ix, 1869.  
*Cambodia.***38. C. erosa**, Prime, Proc. Ac. N. S. Phila. 126, 1861.

Prime, Cat. Corb. 3, 1863. Ann. Lyc. N. H. N. Y. viii,  
213, f. 40, 1866. *Cambodia.*

**39. C. fluminalis**, Megerle.

*Tellina fluminalis*, Müller, Verm. ii, 205, 1774.

*Venus fluminalis*, Chemnitz, Martini et Chemnitz, vi, 319,  
pl. xxx, f. 320, 1782.

*Cyclas Bruguière*, Encycl. Méth. pl. 301, f. 2, 1792.

*Cyclas Euphratica*, Lamarck, An. Mus. Hist. Nat. vii, 420,  
1806.

*Corbicula fluminalis*, Megerle, Mag. Gesell. Naturf. Berlin, v,  
1811.

*Cyrena fuscata*, var. Lamarck, Lam. An. v, 552, 1818.

*Cyrena fluminalis*, Bourguignat, Cat. Sauley. 79, 1852.

*Corbicula fluminalis*, Megerle, Brit. Mus. Cat. Conchif. 222.  
1854. *River Euphrates.*

**40. C. fluminea**, Deshayes.

*Tellina fluminea*, Müller, Verm. ii, 206, 1774.

*Venus fluminea*, Chemnitz, Martini et Chemnitz, vi, 321, pl.  
xxx, f. 322, 323, 1782.

*Cyclas Chinensis*, Lamarck, Ann. Mus. Hist. Nat. vii, 421,  
1806.

*Corbicula fluminea*, Deshayes, Brit. Mus. Cat. Conchif. 226,  
1854. Ann. Lyc. N. H. N. Y. viii, 60, f. 4, 1864.

*China.*

41. **C. fluviatilis**, Deshayes.  
*Tellina fluviatilis*, Müller, Verm. ii, 206, 1774.  
*Corbicula fluviatilis*, Deshayes, Brit. Mus. Cat. Conchif. 226,  
 1854. *China*.
42. **C. fuscata**, Prime.  
*Cyclas*, Bruguière, Encycl. Méth. 302, f. 2, 1792.  
*Cyrena fuscata*, Lamarek (exclus. var.), Lam. An. v, 552,  
 1818. *China*.
43. **C. gubernatoria**, Prime, Ann. Lyc. N. H. N. Y. ix, 1869.  
*Saigon, Cochin China*.
44. **C. gracilis**, Prime, J. Conchyl. x, 389, pl. xiv, f. 7, 1862.  
 Prime, Cat. Corb. 4, 1863. *Java*.
45. **C. imperialis**, Prime, Ann. Lyc. N. H. N. Y. ix, 1869.  
*Pondicherry, India*.
46. **C. insularis**, Prime, Ann. Lyc. N. H. N. Y. viii, 414,  
 1867. *Formosa*.
47. **C. inæquilateralis**, Prime, Proc. Ac. N. S. Phila. 128,  
 1861.  
 Prime, Cat. Corb. 4, 1863. Ann. Lyc. N. H. N. Y. viii,  
 80, f. 30, 1864. *Africa*.
48. **C. Japonica**, Prime, Ann. Lyc. N. H. N. Y. viii, 68, f. 15,  
 1864. *Japan*.
49. **C. Kirkii**, Prime, Ann. Lyc. N. H. N. Y. viii, 66, f. 12,  
 1864. *Mozambique, Central Africa*.
50. **C. Lamarckiana**, Prime, Ann. Lyc. N. H. N. Y. viii, 69  
 f. 16, 1864. *Laos Mountains, Cambodia*.
51. **C. Largillierii**, Deshayes.  
*Cyrena Largillierii*, Philippi, Zeit. Malak. 163, 1844. Phi-  
 lippi, Abbild. Conch. ii, 75, pl. 1, f. 1, 1847.  
*Corbicula Largillierii*, Deshayes, Brit. Mus. Cat. Conchif.  
 225, 1854. Prime, Cat. Corb. 3, 1863. Ann. Lyc. N.  
 H. N. Y. viii, 78, f. 27, 1864. *China*.
52. **C. Larnaudieri**, Prime, Ann. Lyc. N. H. N. Y. vii, 480,  
 1862. Prime, Cat. Corb. 3, 1863. Ann. Lyc. N. H.  
 N. Y. viii, 415, f. 69, 1867. *Siam*.
53. **C. Leana**, Prime, Ann. Lyc. N. H. N. Y. viii, 68, f. 14,  
 1864. *Japan*.
54. **C. leviuscula**, Prime, Cat. Corb. 3, 1863.  
 Ann. Lyc. N. H. N. Y. viii, 64, f. 9, 1864.  
*Cochin China*.

**55. C. limosa**, Deshayes.

*Tellina limosa*, Maton, Trans. Linn. Soc. Lond. x, 325, pl. xxiv, f. 8—10, 1809.

*Cyrena limosa*, Gray, Ann. Phy. 2d ser. ix, 137, 1825.

*Cyrena variegata*, D'Orbigny, Mag. Zool. v, 44, 1835.

*Cyclas variegata*, D'Orbigny, D'Orb. Voy. 567, pl. 82, f. 14—16, 1846.

*Cyclas limosa*, D'Orbigny (error), Loc. sup. cit. pl. 82, f. 14—16, 1846.

*Corbicula semisulcata*, Deshayes, Proc. Zool. Lond. xxii, 343, 1854.

*Corbicula limosa*, Deshayes, Brit. Mus. Cat. Conchif. 231, 1854. Prime, Cat. Corb. 3, 1863. Smith. Inst. Misc. Coll. Prime, Monog. Corb. 5, f. 4, 1865.

*Uruguay, S. America.*

**56. C. Linneana**, Prime, Ann. Lyc. N. H. N. Y. viii, 70, f. 17, 1864.

*Laos Mountains, Cambodia.*

**57. C. lutea**, Morelet, Rev. Mag. Zool. 481, 1862.

Ann. Lyc. N. H. N. Y. viii, 61, f. 6, 1864. *China.*

**58. C. Lydigiana**, Prime, J. Conchyl. ix, 355, 1861.

Loc. sup. cit. x, 388, pl. xiv, f. 8, 1862. Prime, Cat. Corb. 3, 1863. Ann. Lyc. N. H. N. Y. viii, 214, f. 41, 1866.

*Siam.*

**59. C. Malaccana**, Deshayes, Proc. Zool. Lond. xxii, 343, 1854.

Ann. Lyc. N. H. N. Y. viii, 65, f. 10, 1864. *Malacca.*

**60. C. Manillensis**, Prime.

*Cyrena Manillensis*, Philippi, Zeit. Malak. 163, 1841.

*Cyrena fluviatilis*, Philippi, Abbild. Conch. ii, 77, pl. 1, f. 5, 1847.

*Corbicula Manillensis*, Prime, Proc. Ac. N. S. Phila. 271, 1860. Prime, Cat. Corb. 4, 1863. *Manilla.*

**61. C. maxima**, Prime, Proc. Zool. Lond., xxviii, 321, 1860.

*Hab.—?*

**62. C. mediocris**, Prime, Ann. Lyc. N. H. N. Y. vii, 481, 1862.

Prime, Cat. Corb. 4, 1863. Ann. Lyc. N. H. N. Y. viii, 414, f. 68, 1867. *India.*

**63. C. minor**, Prime, Proc. Ac. N. S. Phila. 127, 1861.

Prime, Cat. Corb. 4, 1863. Ann. Lyc. N. H. N. Y. viii, 80, f. 29, 1864. *New Holland.*

64. **C. Moreletiana**, Prime, Ann. Lyc. N. H. N. Y. viii, 416, 1867. *Cambodia.*
65. **C. Moussoni**, Deshayes.  
*Cyrena orientalis*, Lamarek, var. *Javanica*, Mousson, Moll. Java, 86, pl. xv, f. 2, 1849.  
*Corbicula Moussoni*, Deshayes, Brit. Mus. Cat. Conchif. 227, 1854. *Java.*
66. **C. Mulleriana**, Prime, Ann. Lyc. N. H. N. Y. viii, 59, f. 3, 1864. *Fuh Chan River, China.*
67. **C. Nepeanensis**, Deshayes.  
*Cyrena Nepeanensis*, Lesson, Voy. Coquille, ii, 428, pl. xiii, f. 14, 1820. *Now Holland.*
68. **C. nitens**, Deshayes.  
*Cyrena nitens*, Philippi, Zeit. Malak. 163, 1844. Philippi, Abbild. Conch. ii, 76, pl. 1, f. 4, 1847.  
*Corbicula nitens*, Deshayes, Brit. Mus. Cat. Conchif. 227, 1854. Prime, Cat. Corb. 3, 1863. *China.*
69. **C. obscura**, Deshayes, Proc. Zool. Lond. xxii, 342, 1854. *Hab.—?*
70. **C. obsoleta**, Deshayes, Proc. Zool. Lond. xxii, 343, 1854. J. Conchyl. ix, pl. 2, f. 4, 1861. Smith. Inst. Misc. Coll. Prime, Monog. Corb. 4, f. 3, 1865. *Uruguay.*
71. **C. occidentis**, Benson, Asiatic Journal. Brit. Mus. Cat. Conchif. 223, 1854. Prime, Cat. Corb. 4, 1863. Ann. Lyc. N.H. N. Y. viii, 220, f. 51, 1866. *Bengal, India.*
72. **C. orientalis**, Deshayes.  
*Cyrena orientalis*, Lamarek (exclus. var.), Lam. An. v, 552, 1818. Delessert, Recueil pl. vii, f. 8, 1841.  
*Corbicula orientalis*, Deshayes, Brit. Mus. Cat. Conchif. 227, 1854. *China.*
73. **C. ovalina**, Deshayes, Proc. Zool. Lond. xxii, 343, 1854. Brit. Mus. Cat. Conchif. 229, 1854. *New Holland.*
74. **C. ovalis**, Prime, Proc. Zool. Lond. xxviii, 321, 1860. J. Conchyl. ix, 42, pl. ii, f. 6, 1861. *Hab.—?*
75. **C. Paranensis**, Deshayes.  
*Cyrena Paranacensis*, D'Orbigny, Mag. Zool. v, 44, 1835.  
*Cyelas Paranensis*, D'Orbigny, D'Orb. Voy. 567, pl. 83, f. 23, 25, 1846.  
*Corbicula Paranensis*, Deshayes, Brit. Mus. Cat. Conchif. 231, 1854. Prime, Cat. Corb. 3, 1863. Smith. Inst. Misc. Coll. Prime, Monog. Corb. 3, f. 2, 1865. *Parana River, S. America.*

76. **C. parvula**, Prime, Proc. Ac. N. S. Phil. 127, 1861.  
Prime, Cat. Corb. 4, 1863. Ann. Lyc. N. H. N. Y. viii,  
76, f. 25, 1864. *India.*
77. **C. pexplexa**, Prime, Monog. Corb. 75, f. 84, 1865.  
Smith. Inst. Misc. Coll. Prime Monog. Corb. 75, f. 84,  
1865. *S. America.*
78. **C. pexata**, Prime, Cat. Corb. 4, 1863. Ann. Lyc. N. H.  
N. Y. viii, 57, f. 1, 1864. *Fuh Chan River, China.*
79. **C. Pfeifferiana**, Prime, Ann. Lyc. N. H. N. Y. viii, 417,  
1867. *China.*
80. **C. Pisidiiformis**, Prime, Ann. Lyc. N. H. N. Y. viii, 215,  
f. 42, 1866. *Siam.*
81. **C. Primeana**, Morelet (*non Mörch*) Rev. Mag. Zool. 480,  
1862. Ann. Lyc. N. H. N. Y. viii, 58, f. 2, 1864.  
*Che Fou River, China.*
82. **C. prolongata**, Prime, J. Conchyl. ix, 356, 1861.  
Loc. sup. cit. x, 389, pl. xiv, f. 6, 1862. Prime, Cat. Corb.  
4, 1863. *Eastern Australia.*
83. **C. pulchella**, Deshayes.  
*Cyrena pulchella*, Mousson, Moll. Java, 88, pl. xv, f. 4,  
1849.  
*Corbicula pulchella*, Deshayes, Brit. Mus. Cat. Conchif. 228,  
1854. Prime Cat. Corb. 4, 1863. *Java.*
84. **C. pullata**, Deshayes.  
*Cyrena pullata*, Philippi, Abbild. Conch. iii, 110, 1849.  
*Corbicula pullata*, Deshayes, Brit. Mus. Cat. Conchif. 232,  
1854. *Sumatra.*
85. **C. purpurea**, Prime, Cat. Corb. 4, 1863.  
Ann. Lyc. N. H. N. Y. viii, 77, f. 26, 1864.  
*Tigris River.*
86. **C. pusilla**, Deshayes.  
*Cyrena pusilla*, Parreys, Philippi, Abbild. Conch. ii, 78, pl.  
1, f. 7, 1847.  
*Corbicula pusilla*, Deshayes, Brit. Mus. Cat. Conchif. 221,  
1854. Prime, Cat. Corb. 4, 1863. *River Nile.*
87. **C. Quilonensis**, Benson, 1860. Ann. Lyc. N. H. N. Y.,  
viii, 224, f. 56, 1866. *Quilon, India.*
88. **C. radiata**, Deshayes.  
*Cyrena radiata*, Parreys, Philippi, Abbild. ii, 78, pl. 1, f. 8,  
1847.  
*Corbicula radiata*, Deshayes, Brit. Mus. Cat. Conchif. 222,  
1854. Prime, Cat. Corb. 4, 1863. *River Nile.*

- 89. C. recurvata**, Deshayes.  
*Cyrena recurvata*, Valenciennes. Mag. Zool. 11, pl. 119, f. 2, 1835.  
*Cyrena Gaudichaudii*, Valenciennes, (error). Loc. sup. cit. pl. 119, f. 2, 1835.  
*Corbicula recurvata*, Deshayes, Brit. Mus. Cat. Conchif. 226, 1854. *China*.
- 90. C. regularis**, Prime, Proc. Zool. Lond. xxviii, 321, 1860.  
 Prime Cat. Corb. 6, 1863. *Deccan, India*.
- 91. C. rhomboidea**, Prime, Proc. Ac. N. S. Phil. 127, 1861.  
 Prime, Cat. Corb. 3, 1863. Ann. Lyc. N. H. N. Y. viii, 66, f. 11, 1864. *Malacca*.
- 92. C. rivalis**, Deshayes.  
*Cyrena rivalis*, v. d. Busch. Philippi, Abbild. iii, 110, pl. 3, f. 5, 1849.  
*Corbicula rivalis*, Deshayes, Brit. Mus. Cat. Conchif. 228, 1854. Prime, Cat. Corb. 4, 1863. *Java*.
- 93. C. rotunda**, Prime, Proc. Ac. N. S. Phila. 80, 1860.  
 Prime. Cat. Corb. 3, 1863. Smith Inst. Misc. Cell., Prime. Monog. Corb. 5, 1865. *Guyana S. America*.
- 94. C. Sayana**, Prime, Ann. Lyc. N. H. N. Y. viii, 71, f. 19, 1864. *Philippine Islands*.
- 95. C. solidula**, Prime.  
 Proc. Ac. N. S. Phila. 127, 1861. Prime, Cat. Corb. 4, 1863. Ann. Lyc. N. H. N. Y. viii, 81, f. 31, 1864. *Hab.—?*
- 96. C. Stimpsonianana**, Prime.  
 Ann. Lyc. N. H. N. Y. viii, 222, f. 54, 1866. *Hab.—?*
- 97. C. striatella**, Deshayes, Proc. Zool. Lond. xxii, 344, 1854.  
*Corbicula violacea*, Prime. Proc. Ac. N. S. Phila. 128, 1861.  
 Prime, Cat. Corb. 3, 1863.  
*Corbicula striatella*, Deshayes. Prime, Cat. Corb. 3, 1863.  
 Ann. Lyc. N. H. N. Y. viii, 74, f. 22, 1864. *India*.
- 98. C. subradiata**, Prime.  
*Cyrena subradiata*, Kurr in litt.  
*Corbicula subradiata*, Prime. Proc. Ac. N. S. Phila. 127, 1861. Prime, Cat. Corb. 4, 1863. Ann. Lyc. N. H. N. Y. viii, 75, f. 23, 1864. *India*.
- 99. C. sulcatina**, Deshayes, Proc. Zool. Lond. xxii, 345, 1854.  
 Ann. Lyc. N. H. N. Y. viii, 79, f. 28, 1864. *China*.



- 100. *C. tenuistriata***, Prime, Proc. Zool. Lond. xxviii, 322, 1860.  
J. Conchyl. ix, 40, pl. ii, f. 3, 1861. *Hab.*—?
- 101. *C. triangularis***, Deshayes, Proc. Zool. Lond. xxii, 345, 1854.  
Prime, Cat. Corb. 4, 1863. Ann. Lyc. N. H. N. Y. viii, 215, f. 43, 1866. *Hab.*—?
- 102. *C. trigona***, Deshayes, Proc. Zool. Lond. xxii, 344, 1854.  
Prime, Cat. 4, 1863. Ann. Lyc. N. H. N. Y. viii, 221, f. 53, 1866. *India.*
- 103. *C. trigonella***, Deshayes.  
*Cyrena trigonella*, Lamarck. Lam. An. v, 552, 1818.  
*Corbicula trigonella*, Deshayes. Brit. Mus. Cat. Conchif. 234, 1854. *Hab.*—?
- 104. *C. tumida***, Deshayes, Proc. Zool. Lond. xxii, 343, 1854.  
Prime, Cat. Corb. 4, 1863. Ann. Lyc. N. H. N. Y. viii, 219, f. 50, 1866. *Borneo.*
- 105. *C. venustula***, Prime, Cat. Corb. 4, 1863.  
Ann. Lyc. N. H. N. Y. viii, 73, f. 21, 1864. *Philippine Islands.*
- 106. *C. vulgaris***, Prime, Anc. Lyc. N. H. N. Y. viii, 223, f. 25, 1866. *Hab.*—?
- 107. *C. Woodiana***, Deshayes.  
*Cyrena Woodiana*, Lea, Trans. Amer. Phil. Soc. Phila. v, 110, pl. xviii, f. 55, 1832.  
*Cyrena similis*, Gray, Griffith, An. Kingd. xii, pl. xx, f. 2, 1834.  
*Corbicula grandis*, Deshayes, Proc. Zool. xxii, 344, 1854.  
*Corbicula similis*, Deshayes, Brit. Mus. Cat. Conchif. 225, 1854.  
*Corbicula Woodiana*, Deshayes, Loc. sup. cit. 225, 1854.  
*Corbicula Primeana*, Mörch, (*non Morelet*), J Conchyl. ix, 347, 1861.  
*Corbicula Woodiana*, Deshayes, Prime, Cat. Corb. 3, 1863.  
Ann. Lyc. N. H. N. Y. viii, 226, f. 59, 1866. *China.*

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TO BE EXCLUDED.

- Corb. Chilensis*, Prime. = *Pisid. Chilense*.  
*Corb. grandis*, Deshayes. = *Corb. Woodiana*.  
*Corb. hammalis*, Férussac. = Undescribed.  
*Corb. incrassata*, Deshayes. = *Corb. cuneata*.

*Corb. notata*, Prime. = *Corb. Cumingii*.  
*Corb. Primeana*, Mörch. (non Morelet.) = *Corb. Woodiana*.  
*Corb. semisulcata*, Deshayes. = *Corb. limosa*.  
*Corb. similis*, Deshayes. = *Corb. Woodiana*.  
*Corb. squalida*, Deshayes. = *Corb. Cumingii*.  
*Corb. variegata*, Deshayes. = *Corb. limosa*.  
*Corb. ventricosa*, Prime. = *Corb. convexa*.  
*Corb. violacea*, Prime. = *Corb. striatella*.

GENUS **BATISSA**, Gray.

Ann. Mag. N. H. n. ser. ix, 34, 1852.

*Cyprina*, *Cyclas*, Bruguière, Encycl. Méth. 1792.

*Cyrena*, Lamarek, Lam. An. v, 553, 1818.

*Venus*, Gray, Wood. Index, Test. Suppl. pl. ii, f. 13, 1828.

1. **B. atrata**, Deshayes, Proc. Zool. Lond. xxii, 14, 1854.  
*Hab.*—?
2. **B. Australis**, Deshayes, Proc. Zool. Lond. xxii, 346, 1854.  
*Australia.*
2. **B. Childrenæ**, Deshayes.  
*Venus Childreni*, Gray, Wood, Index Test. Suppl. pl. ii, f. 13, 1828.  
*Cyrena Childrence*, Gray, Ann. Phil. 2d ser. 117, 1825.  
*Batissa Childrenæ*, Deshayes, Brit. Mus. Cat. Conchif. 237, 1854. Prime, Cat. Corb. 5, 1863. *Philippine Islands.*
4. **B. compressa**, Prime, Proc. Zool. Lond. xxviii, 320, 1860.  
*Borneo.*
5. **B. Corbiculoides**, Deshayes, Proc. Zool. Lond. xxii, 14, 1854.  
*New Guinea.*
6. **B. elegans**, Prime, J. Conchyl. x, 385, pl. xiii, f. 1, 1862.  
Prime, Cat. Corb. 5, 1863. *Hab.*—?
7. **B. elongata**, Prime, Proc. Zool. Lond. xxviii, 320, 1860.  
Act. Soc. Linn. Bord. xxiv, 324, 1863. *New Caledonia.*
8. **B. fortis**, Prime, Proc. Zool. Lond. xxviii, 320, 1860.  
Act. Soc. Linn. Bord. xxiv, 324 1863. *New Caledonia.*
9. **B. fuscata**, Prime, Proc. Zool. Lond. xxviii, 319, 1860.  
*Hab.*—?
10. **B. gigantea**, Prime, Ann. Lyc. N. H. N. Y. vii, 112, 1859.  
*Hab.*—?
11. **B. gracilis**, Prime, Proc. Zool. Lond. xxviii, 319, 1860.  
J. Conchyl. ix, 38, pl. ii, f. 1, 1861. *Hab.*—?

12. **B. humerosa**, Deshayes, Proc. Zool. Lond. xxii, 14, 1854.  
*New Guinea.*
13. **B. inflata**, Prime, Proc. Zool. Lond. xxviii, 320, 1860.  
*Nicobar Islands.*
14. **B. insignis**, Deshayes, Proc. Zool. Lond. xxii, 13, 1854.  
Prime, Cat. Corb. 5, 1854. *Calamang, Luzon Island.*
15. **B. Jayana**, Deshayes.  
*Cyrena Jayensis*, Lea, Trans. Amer. Phil. Soc. Phila. v, 108,  
pl. xvii, f. 52, 1832.  
*Cyrena violacea*, Lamarek (var. *Javanica*), Mousson, Moll.  
Java, 88, pl. xv, f. 1, 1849.  
*Batissa Jayana*, Deshayes, Brit. Mus. Cat. Conchif. 237,  
1854.  
*Batissa sphaericula*, Prime, Proc. Zool. Lond. 1862.  
Prime, Cat. Corb. 5, 1863. *Sumatra?—Java.*
16. **B. Keraudrenia**, Deshayes.  
*Cyrena Keraudrenia*, Lesson, Voy. Coquille, 429, pl. xi, f. 3,  
1829.  
*Batissa Keraudrenia*, Deshayes, Brit. Mus. Cat. Conchif.  
236, 1854. Prime, Cat. Corb. 5, 1863. *Waigiou.*
17. **B. lenticularis**, Deshayes, Proc. Zool. Lond. xxii, 14,  
1854.  
Prime, Cat. Corb. 5, 1863. *Philippine Islands.*
18. **B. megadesma**, Deshayes, Proc. Zool. Lond. xxii, 14,  
1854. *Hab.—?*
19. **B. minor**, Prime, Proc. Zool. Lond. xxviii, 320, 1860.  
J. Conchyl. xiii, 207, 1865. *Feejee Islands.*
20. **B. obesa**, Deshayes.  
*Cyrena obesa*, Hinds, Ann. Mag. N. H. n. ser. x, 81, 1842.  
Voy. Sulph. 66, pl. xxi, f. 6, 1845.  
*Batissa obesa*, Deshayes, Brit. Mus. Cat. Conchif. 238, 1854.  
Prime, Cat. Corb. 5, 1863. *Feejee Islands.*
21. **B. Philippinarum**, Hanley.  
*Cyrena Philippinarum*, Hanley, Proc. Zool. Lond. xii, 159,  
1844. Hanley, Descrip. Cat. pl. xiv, f. 1844.  
*Philippine Islands.*
22. **B. ponderosa**, Prime, Proc. Soc. N. H. Bost. viii, 273,  
1862.  
Prime, Cat. Corb. 5, 1863. Ann. Lyc. N. H. N. Y. viii,  
231, f. 62, 1866. *New Caledonia.*

23. **B. producta**, Deshayes, Proc. Zool. Lond. xxii, 13, 1854.  
J. Conchyl. xiii, 208, 1865. *Philippine Islands.*
24. **B. rotundata**, Deshayes.  
*Cyrena rotundata*, Lea, Trans. Amer. Phil. Soc. Phila. v, 107,  
pl. xvii, f. 51, 1832. Hanley, Descrip. Cat. 93, pl. xiv,  
f. 55, 1844. *Java.*
25. **B. similis**, Prime, Ann. Lyc. N. H. N. Y. vii. 112, 1859.  
Prime, Cat. Corb. 5, 1863. Ann. Lyc. N. H. N. Y. viii,  
229, f. 60, 1866. *Nicobar.*
26. **B. solidula**, Prime, Proc. Zool. Lond.  
Prime, Cat. Corb. 5, 1863. Ann. Lyc. N. H. N. Y. viii,  
83, f. 32, 1864. *Hab.—?*
27. **B. tenebrosa**, Deshayes.  
*Cyrena tenebrosa*, Hinds, Ann. Mag. N. H. n. ser. x, 81,  
1842. Hanley, Descrip. Cat. pl. xv, f. 2, 1844.  
*Cyrena regulata*, Gassies, J. Conchyl. vii, 372, 1858.  
*Batissa tenebrosa*, Deshayes, Brit. Mus. Cat. Conchif. 238,  
1854. Prime, Cat. Corb. 5, 1863. *Fejee Islands.*
28. **B. triquetra**, Deshayes, Proc. Zool. Lond. xxii, 13, 1854.  
Prime, Cat. Corb. 5, 1863. Act. Soc. Linn. Bord. xxiv,  
323, pl. viii, f. 17, 1863. J. Conchyl. xiii, 207, 1865.  
Ann. Lyc. N. H. N. Y. viii, 230, f. 61, 1866.  
*Philippine Islands.*
29. **B. unioniformis**, Prime, Proc. Zool. Lond. xxviii, 319,  
1860.  
Prime, Cat. Corb. 5, 1863. *Fejee Islands.*
30. **B. violacea**, Deshayes.  
*Cyelas*, Encycl. Méth. pl. 301, f. 1, a-b.  
*Cyelas violacea*, Lamarck, Ann. Mus. Hist. Nat. vii, 421,  
1806.  
*Cyrena violacea*, Lamarck, Lam. An. v, 553, 1818. Deles-  
sert, Recueil, pl. vii, f. 5, 1841.  
*Batissa violacea*, Deshayes, Brit. Mus. Cat. Conchif. 238,  
1854. *The Islands of the Pacific.*

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TO BE EXCLUDED.

*Batissa eximia*, Deshayes, = *Cyrena eximia*.  
*Batissa impressa*, H. and A. Adams, = *Cyrena eximia*.  
*Batissa sphaericula*, Prime, = *B. Jayana*.

GENUS **VELORITA**, Gray.

Griffith, An. Kingd. xii, pl. xxxi, f. 5, 1834.

*Cyrena*, Gray, Ann. Phy. n. ser. ix, 136, 1825.

*Venus*, Gray, Wood, Index, Test. Suppl. pl. ii, f. 14, 1828.

1. **V. Cochinesis**, Hanley.

*Cyrena Cochinesis*, Hanley, Proc. Zool. Lond. xxvi, 543, 1858.

*Cyrena Corbiculiformis*, Prime, Proc. Ac. N. S. Phila. 80, 1860. Prime, Cat. Corb. 6, 1863.

*Velorita Cochinesis*, Hanley, Ann. Lyc. N. H. N. Y. viii, 236, f. 66, 1866. *Madras Coast, India.*

2. **V. Cyprinoides**, Gray.

*Cyrena Cyprinoides*, Gray, Ann. Phy. n. ser. ix, 136, 1825.

*Venus Cyprinoides*, Gray, Wood, Index, Test. Suppl. pl. ii, f. 14, 1828.

*Velorita Cyprinoides*, Gray, Griffith, An. Kingd. xii, pl. xxxi, f. 5, 1834. *Philippine Islands?*

3. **V. parvula**, Prime, Ann. Lyc. N. H. N. Y. viii, 418, 1867.

*Hab.—?*

GENUS **CYRENA**, Lamarek.

Lam. An. v, 551, 1818.

*Venus*, Chemnitz, Martini et Chemnitz, vi, 333, pl. xxxii, f. 336, 1782.

*Cyclas*, Bruguière, Encycl. Méth. pl. 301, 302, 1792.

*Cyanoeyelas*, Férussac, Dict. Sci. Nat. xii, 1818.

*Polymesoda*, Rafinesque, Ann. Gen. Sci. Phys. et Nat. v, 219, 1820.

*Mactra*, Brognart, Mem. Vincent, 81, pl. v, f. 8, 1823.

*Geloina*, Gray, Synop. Brit. Mus. 75, 1844.

1. **C. acuta**, Prime, J. Conchyl. ix, 355, 1861.

Loc. sup. cit. x, 387, pl. xiv, f. 1, 1862. Prime, Cat. Corb. 5, 1863. Smith. Inst. Misc. Coll. Prime, Monog. Corb. 22, f. 17, 1865. *Central America.*

2. **C. affinis**, Deshayes, Proc. Zool. Lond. xxii, 16, 1854.

*Australia.*

3. **C. anomala**, Deshayes, Proc. Zool. Lond. xxii, 21, 1854.

*Cyrena Peruviana*, Deshayes, Brit. Mus. Cat. Conchif. 259, 1854.

*Cyrena anomala*, Deshayes, Prime, Cat. Corb. 6, 1863, Smith. Inst. Misc. Coll. Prime, Monog. Corb. 30, f. 24, 1865. *Peru.*

4. **C. arctata**, Deshayes, Proc. Zool. Lond. xxii, 20, 1854.  
 Prime, Cat. Corb. 5, 1863. Smith. Inst. Misc. Coll.  
 Prime, Monog. Corb. 16, f. 10, 1865.  
*Lake Maracaibo, S. America.*
5. **C. Bengalensis**, Lamarck.  
*Venus Bengalensis*, Lister, List. Hist. An. pl. 345, f. 182.  
*Cyrena Bengalensis*, Lamarck, An. v, 554, 1818.  
*Cyclas Bengalensis*, Férussac, Cat. 20, 1837.  
*Cyrena turgida*, Lea, Trans. Amer. Phil. Soc. Phila. v, 109,  
 pl. xviii, f. 51, 1832.  
*Cyrena Bengalensis*, Lamarck, Delessert Recueil, pl. vii, f. 6,  
 a, d, 1841.  
*Cyrena turgida*, Lea, Hanley, Descrip. Cat. 93, pl. xiv, f. 50,  
 1844.  
*Cyrena Bengalensis*, Lamarck, Prime, Cat. Corb. 6, 1865.  
*Bengal, India.*
6. **C. Bernardana**, Prime, Proc. Ac. N. S. Phila. 126,  
 1861.  
 Prime, Cat. Corb. 6, 1863. Ann. Lyc. N. H. N. Y. viii,  
 83, f. 33, 1864.  
*New Caledonia.*
7. **C. Boliviana**, Philippi, Zeit. Malak. 70, 1851.  
 Smith. Inst. Misc. Coll., Prime Monog. Corb. 27, 1865.  
*Bolivia.*
8. **C. brunnea**, Prime, Proc. Zool. Lond. xxviii, 321, 1860.  
*Hab.—?*
9. **C. Buschii**, Philippi, Abbild. Conch. iii, 78, pl. ii, f. 2,  
 1849.  
 Brit. Mus. Cat. Conchif. 243, 1854. *China.*
10. **C. Californica**, Prime.  
*Cyrena subquadrata*, Deshayes (preoc.), Proc. Zool. Lond.  
 xxii, 21, 1854.  
*Cyrena Californica*, Prime, Proc. Ac. N. S. Phila. 276, 1860.  
 Smith. Inst. Misc. Coll., Prime Monog. Corb. 24, 1865.  
*California.*
11. **C. Caroliniensis**, Lamarck.  
*Cyclas Caroliniensis*, Bosc., Féruss. Méth. Conchyl. 1807.  
*Cyclas Caroliniana*, Bosc., Hist. Nat. Coq. iii, 37, pl. xxiii,  
 f. 4, 1810.  
*Cyrena Caroliniensis*, Lamarck, Lam. An. v, 558, 1818. Say,  
 pl. lxii. Brit. Mus. Cat. Conchif. 254, 1854. Prime, Cat.  
 Corb. 5, 1863. Smith. Inst. Misc. Coll., Prime Monog.  
 Corb. 12, f. 6, 1865. *Alabama, Florida and Georgia.*



- 12. C. Ceylonica**, Lamarek.  
*Venus Ceylonica*, Chemnitz, Martini et Chemnitz, vi, 333,  
 pl. xxxii. f. 336, 1782.  
*Venus coarxans*, Gmelin, Syst. Nat. 3278, f. 336, 1788.  
*Cyclas*, Bruguière, Encycl. Méth. pl. 302, f. 4, a, b, 1792.  
*Cyclas Zeylanica*, Lamarek, Ann. Mus. Hist. Nat. vii, 420,  
 1806.  
*Cyrena Zeylanica*, Lamarek, An. v. 554, 1818. Prime Cat.  
 Corb. 6, 1863. *Ceylon*.
- 13. C. Chilina**, Prime, Ann. Lyc. N. H. N. Y. viii, 418, 1867.  
*Chili*.
- 14. C. colorata**, Prime, Cat. Corb. 5, 1863.  
 Smith. Inst. Misc. Coll., Prime Monog. Corb. 30, f. 23,  
 1865. *Island of New Providence, W. I.*
- 15. C. compta**, Deshayes, Proc. Zool. Lond. xxii, 18, 1854.  
*Hab.—?*
- 16. C. conjuncta**, Deshayes, Proc. Zool. Lond. xxii, 15, 1854.  
*Hab.—?*
- 17. C. Cubensis**, Prime.  
*Cyclas maritima*, D'Orbigny, Sagra, Cuba, Moll. ii, 280, pl.  
 xxi, f. 47—50, 1853.  
*Cyrena Cubensis*, Prime, Smith. Inst. Misc. Coll., Prime Mo-  
 nog. Corb. 29, 1865. *Cuba*.
- 18. C. Cumingii**, Deshayes, Proc. Zool. Lond. xxii. 22,  
 1854.  
 Smith. Inst. Misc. Coll., Prime Monog. Corb. 25, 1865.  
*Central America*.
- 19. C. Cypriniformis**, Prime, Cat. Corb. 6, 1863.  
 Ann. Lyc. N. H. N. Y. viii, 88, f. 37, 1864.  
*Northern Australia*.
- 20. C. Cyprinoides**, Quoy, Voy. Astrolabe, iii, 513, pl.  
 lxxxii, f. 1—3, 1834. *New Guinea*.
- 22. C. decipiens**, Deshayes, Proc. Zool. Lond. xxii, 17, 1854.  
*Hab.—?*
- 22. C. divaricata**, Deshayes, Proc. Zool. Lond. xxii, 17, 1854.  
*New Guinea*.
- 23. C. dura**, Deshayes, Proc. Zool. Lond. xxii, 20, 1854.  
*Hab.—?*
- 24. C. Essingtonensis**, Deshayes, Proc. Zool. Lond. xxii, 19,  
 1854. *Port Essington, Australia*.

25. **C. eximia**, Dunker, Zeit. Malak. 51, 1852.  
*Cyrena impressa*, Deshayes, Proc. Zool. Lond. xxii, 18, 1854.  
*Batissa eximia*, Deshayes, Brit. Mus. Cat. Conchif., 235, 1854.  
*Cyrena eximia*, Dunker, Nov. Conch. livraison 8, p. 8, pl. xxiv, 1857.  
*Batissa impressa*, H. and A. Adams, Gen. Rec. Moll. ii, 448, 1858.  
*Cyrena eximia*, Dunker, Prime Cat. Corb. 6, 1863. *Java*.
26. **C. expansa**, Mousson, Moll. Java, 89, pl. xiv. 1849.  
 Brit. Mus. Cat. Conchif. 243, 1854. *Java*.
27. **C. exquisita**, Prime, Ann. Lyc. N. H. N. Y. viii, 417, 1867.  
*Panama, New Grenada*.
28. **C. fallax**, Deshayes, Proc. Zool. Lond. xxii, 15, 1854.  
 Prime, Cat. Corb. 6, 1863.  
*Australia—Philippine Islands?*
29. **C. flava**, Prime, Proc. Zool. Lond. xxviii, 320, 1860.  
*Hab.—?*
30. **C. Floridana**, Conrad, Proc. Ac. N. S. Phila. iii, 23, pl. 1, f. 1, 1846.  
 Brit. Mus. Cat. Conchif. 257, 1854. Prime, Cat. Corb. 5, 1863. Smith. Inst. Misc. Coll., Prime Monog. Corb. 28, f. 21, 1865.  
*Tampa Bay, Florida*.
31. **C. Fontaineii**, Carpenter.  
*Cyclas Fontaineii*, D'Orbigny, Voy. 569, pl. 83, f. 14, 15, 1844.  
*Cyrena Fontaineii*, Carpenter, Carp. Mazat. Shells, 114, 1857. Prime, Cat. Corb. 6, 1863. Smith. Inst. Misc. Coll., Prime Monog. Corb. 21, f. 16, 1865.  
*South America*.
32. **C. fortis**, Prime, J. Conchyl. ix, 355, 1861.  
 Loc. sup. cit. x, 387, pl. xiv, f. 2, 1862. Prime, Cat. Corb. 5, 1863. Smith. Inst. Misc. Coll., Prime Monog. Corb. 17, f. 11, 1865.  
*Ecuador, S. America*.
33. **C. Galathea**, Rheinhardt, Mörch, Cat. Kierulf, 32, pl. ii, 1850. Prime, Cat. Corb. 6, 1863. *Nicobar Islands*.
34. **C. germana**, Prime, Ann. Lyc. N. H. N. Y. viii, 417, 1867.  
*Tampico, Mexico*.
35. **C. incerta**, Deshayes, Proc. Zool. Lond. xxii, 19, 1854.  
*Hab.—?*

36. *C. inflata*, Philippi, Zeit. Malak. 71, 1851.  
Smith. Inst. Misc. Coll., Prime Monog. Corb. 26, 1865.  
*Costa Rica.*
37. *C. inquinata*, Deshayes, Proc. Zool. Lond. xxii. 15, 1854.  
*China.*
38. *C. insignis*, Deshayes, Proc. Zool. Lond. xxii, 20, 1854.  
I. Conchyl. ix, 39, pl. ii, f. 2, 1861. Smith. Inst. Misc.  
Coll., Prime Monog. Corb. 15, f. 9, 1865. *California.*
39. *C. isocardioides*, Deshayes, Proc. Zool. Lond. xxii, 22,  
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*Western Columbia, S. America.*
40. *C. Jukesi*, Deshayes, Proc. Zool. Lond. xxii, 19, 1854.  
*Cape Upstart, Northern Australia.*
41. *C. lævis*, Prime, Proc. Ac. N. S. Phila. 125, 1861.  
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233, f. 64, 1866. *Borneo.*
42. *C. lauta*, Deshayes, Proc. Zool. Lond. xxii, 15, 1854.  
Prime, Cat. Corb. 7, 1863. *Hab.—?*
43. *C. mactriformis*, Prime.  
*Cyrena mactroides*, Deshayes (preoc.), Proc. Zool. Lond. xxii,  
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*Cyrena mactriformis*, Prime, Proc. Ac. N. S. Phila. 281, 1860.  
*Hab.—?*
44. *C. maritima*, C. B. Adams, Ann. Lyc. N. H. N. Y. v,  
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Proc. Zool. Lond. xxii, 345, 1854. Brit. Mus. Cat. Con-  
chif. 258, 1854. Prime, Cat. Corb. 5, 1863. Smith.  
Inst. Misc. Coll., Prime Monog. Corb. 27, f. 20, 1865.  
*Panama.*
45. *C. Mexicana*, Sowerby, Zool. Jour. 364, 1829.  
*Cyrena fragilis*, Deshayes, Mus. Cuming.  
*Cyrena æquilateralis*, Deshayes, Proc. Zool. Lond. xxii, 20,  
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*Cyrena mexicana*, Sowerby, Brit. Mus. Cat. Conchif. 260,  
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Monog. Corb. 22, f. 18, 1865. *Mazatlan and Panama.*
46. *C. Morchiana*, Prime, Ann. Lyc. N. H. N. Y. viii, 232,  
f. 63, 1866. *Hab.—?*

**47. C. Nicaraguana**, Prime.

*Cyrena solida*, Philippi, (preoc.), Philippi, Abbild. Conch. ii, 78, pl. 1, f. 9, 1847. Brit. Mus. Cat. Conchif. 254, 1854.  
 Prime, Cat. Corb. 5, 1863. Smith. Inst. Misc. Coll.,  
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*Nicaragua and Balize.*

**48. C. nitida**, Deshayes, Proc. Zool. Lond. xxii, 23, 1854.

Prime, Cat. Corb. 6, 1863.

*Borneo.*

**49. C. nitidula**, Deshayes, Proc. Zool. Lond. xxii, 23, 1854.

Smith. Inst. Misc. Coll., Prime Monog. Corb. 20, 1865.

*South America ?*

**50. C. notabilis**, Deshayes, Proc. Zool. Lond. xxii, 21, 1854.

Smith. Inst. Misc. Coll., Prime Monog. Corb. 28, 1865.

*Peru.*

**51. C. oblonga**, Quoy, Voy. Astrolabe, iii, 517, pl. 82, f. 6-8, 1834.

Brit. Mus. Cat. Conchif. 257, 1854.

*Vanikoro.*

**52. C. obscura**, Prime, Proc. Zool. Lond. xxviii, 321, 1860.

Smith. Inst. Misc. Coll., Prime Monog. Corb. 15, 1865.

*South America.*

**53. C. olivacea**, Carpenter.

*Cyrena Fontaineii*, Philippi, Zeit. Malak. 70, 1851. Brit. Mus. Cat. Conchif. 253, 1854.

*Cyrena olivacea*, Carpenter, Mazat. Shells, 114, 1857. Prime, Cat. Corb. 5, 1863. Smith. Inst. Misc. Coll., Prime Monog. Corb. 17, f. 12, 1865.

*Mazatlan.*

**54. C. oviformis**, Deshayes, Proc. Zool. Lond. xxii, 16, 1854.

Prime, Cat. Corb. 6, 1863.

*Port Essington, Australia.*

**55. C. pallida**, Deshayes, Proc. Zool. Lond. xxii, 17, 1854.

*Hab.—?*

**56. C. Panamensis**, Prime.

*Cyrena inflata*, Deshayes (preoc.), Proc. Zool. Lond. xxii, 23, 1854.

*Cyrena Panamensis*, Prime, Smith. Inst. Misc. Coll., Prime Monog. Corb. 24, 1865.

*Panama.*

**57. C. Papuana**, Lesson, Mag. Zool. pl. xi, 1832.

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*New Guinea and Waigion.*

**58. C. placens**, Hanley, Proc. Zool. Lond. xii, 160, 1844.

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*Honduras.*

59. **C. placida**, Deshayes, Proc. Zool. Lond. xxii, 19, 1854.  
Prime Cat. Corb. 7, 1863. *Port Curtis, South Australia.*
60. **C. ponderosa**, Prime, Proc. Ac. N. S. Phila. 80, 1860.  
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61. **C. proxima**, Prime, Cat. Corb. 6, 1863.  
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62. **C. pullastra**, Mörch, Malak. Bl. vii, 194, 1860.  
Smith. Inst. Misc. Coll., Prime Monog. Corb. 26, 1865.  
*Nicaragua.*
63. **C. radiata**, Hanley, Proc. Zool. Lond. xii, 159, 1844.  
Brit. Mus. Cat. Conchif. 254, 1854. Prime, Cat. Corb. 5.  
1863. Smith. Inst. Misc. Coll., Prime Monog. Corb.  
13, f. 7, 1865. *Nicaragua.*
64. **C. Recluzii**, Prime.  
*Cyrena inflata*, Deshayes (preoc.), J. Conchyl. iv. 251, pl. vii,  
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*Cyrena Recluzii*, Prime, Smith. Inst. Misc. Coll., Prime Mo-  
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65. **C. regularis**, Prime, Proc. Ac. N. S. Phila. 136, 1861.  
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90, f. 38, 1864. *Hab.—?*
66. **C. salmacida**, Morelet, Test. Nov. 26, 1851.  
Brit. Mus. Cat. Conchif. 259, 1854. Ann. Lyc. N. H. N.  
Y. vii, 314, pl. vi, f. 1, 1861. Smith. Inst. Misc. Coll.,  
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67. **C. Siamica**, Prime, Proc. Ac. N. S. Phila. 126, 1861.  
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86, f. 35, 1864. *Siam.*
68. **C. similis**, Deshayes, Proc. Zool. Lond. xxii, 16, 1854.  
Prime, Cat. Corb. 6, 1863. *Borneo.*
69. **C. sphærica**, Prime, J. Conchyl. ix, 354, 1861.  
Loc. sup. cit. x, 386, pl. xiii, f. 2, 1862. Prime, Cat. Corb.  
7, 1863. *Hab.—?*
70. **C. sinuosa**, Deshayes.  
*Cyrena Zeylanica*, Mousson, Moll. Java, 89, pl. xii, 1849.  
*Cyrena sinuosa*, Deshayes, Proc. Zool. Lond. xxii, 18, 1854.  
Prime, Cat. Corb. 6, 1863. *Java.*

71. **C. sordida**, Hanley, Proc. Zool. Lond. xii, 159, 1844.  
Hanley, Descrip. Cat. pl. xiv, f. 51, 1844. Brit. Mus. Cat.  
Conchif. 255, 1854. Smith. Inst. Misc. Coll., Prime  
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72. **C. sublobata**, Deshayes, Proc. Zool. Lond. xxii, 18, 1854.  
*Cyrena Caledonica*, Gassies, J. Conchyl. vi, 277, 1857.  
“ *sublobata*, Deshayes, Act. Soc. Linn. Bord. xxiv,  
322, pl. viii, f. 16, 1863. Prime, Cat. Corb. 5, 1863.  
*New Caledonia*.
73. **C. suborbicularis**, v. d. Busch, Philippi. Abbild. Conch.  
iii, 77, pl. ii, f. 1, 1849. Brit. Mus. Cat. Conchif. 251,  
1854. *Manilla*.
74. **C. Sumatrensis**, Sowerby, Gen. Shells, 1, 1820–24.  
Philippi. Abbild. Conch. iii, 109, pl. iii, f. 4, 1849. Brit.  
Mus. Cat. Conchif. 242, 1854. Prime, Cat. Corb. 6,  
1863. *Sumatra*.
75. **C. Tennentii**, Hanley, Proc. Zool. Lond. xxv, 23, 1858.  
*Ceylon*.
76. **C. triangula**, v. d. Busch, Philippi. Abbild. Conch. iii,  
78, pl. ii, f. 3, 1849.  
*Cyrena altilis*, Gould, J. N. H. Bost. vi, 400, pl. xvi, f. 5 bis,  
1852.  
*Cyrena triangula*, v. d. Busch, Brit. Mus. Cat. Conchif. 253,  
1854.  
*Cyrena varians*, Carpenter, (pars.) Carp. Mazat. Shells, 115,  
1857.  
*Cyrena Mexicana*, Carpenter, (pars.) Carp. Mazat. Shells, 115,  
1857.  
*Cyrena triangula*, v. d. Busch, Smith. Inst. Misc. Coll.,  
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77. **C. triangularis**, Metcalfe, Proc. Zool. Lond. xix, 74, 1851.  
Brit. Mus. Cat. Conchif. 242, 1854. Prime, Cat. Corb. 6,  
1863. Ann. Lyc. N. H. N. Y. viii, 234, f. 65, 1866.  
*Borneo*.
78. **C. tribunalis**, Prime. in litt. *Tecames River, Ecuador*.
79. **C. tumida**, Prime.  
*Cyrena angulata*, Deshayes, (preoc.) Proc. Zool. Lond.  
xxii, 22, 1854.  
*Cyrena tumida*, Prime, Smith. Inst. Misc. Coll., Prime  
Monog. Corb. 26, 1865. *Central America*.
80. **C. Vanikorensis**, Quoy, Voy. Astrolabe, iii, 515, pl. 82,  
f. 4, 5, 1834.  
Brit. Mus. Cat. Conchif. 252, 1854. *Vanikoro*.



81. *C. ventricosa*, Deshayes, Proc. Zool. Lond. xxii, 16, 1854.  
Prime, Cat. Corb. 6, 1863.

*Australia and the Philippine Islands.*

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TO BE EXCLUDED.

- C. æquilateralis*, Deshayes. = *C. Mexicana*.  
*C. Africana*, Krauss. = *Corb. Africana*.  
*C. Astartina*, Martens. = *Corb. Astartina*.  
*C. Ayrensis*, Kurr. = *Corb. Ayrensis*.  
*C. altilis*, Gould. = *C. Mexicana*.  
*C. angulata*, Deshayes. = *C. tumida*.  
*C. Australis*, Lamarck. = *Corb. Australis*.  
*C. Caledonica*, Gassies. = *C. sublobata*.  
*C. Charpenterianus*, Bourguignat. = an *Ancylus*, typ. error.  
*C. Childrenæ*, Gray. = *C. Childrenæ*.  
*C. chinensis*, Férussac, undescribed.  
*C. compressa*, Mousson. = *Corb. compressa*.  
*C. consobrina*, Cailliaud. = *Corb. consobrina*.  
*C. cor*, Lamarck. = *Corb. cor*.  
*C. corbiculiformis*, Prime. = *V. Cochinnensis*.  
*C. cordiformis*, Recluz. = *C. Recluzii*.  
*C. crassula*, Mousson. = *Corb. crassula*.  
*C. cuneata*, Jonas. = *Corb. cuneata*.  
*C. cyclostoma*, Bourguignat. = an *Ancylus*, typ. error.  
*C. Cyprinoides*, Gray. = *V. Cyprinoides*.  
*C. debilis*, Gould. = *Corb. debilis*.  
*C. Delalandii*, Férussac, undescribed.  
*C. depressa*, Lamarck. = *Corb. borealis*.  
*C. Deshayesianus*, Bourguignat. = an *Ancylus*, typ. error.  
*C. Euphratica*, Bronn, undescribed.  
*C. fluminalis*, Bourguignat. = *Corb. fluminalis*.  
*C. fluminea*, Férussac, undescribed.  
*C. fluviatilis*, Philippi. = *Corb. fluviatilis*.  
*C. fragilis*, Deshayes. = *C. Mexicana*.  
*C. fuscata*, Lamarck. = *Corb. fluminalis*.  
*C. Gaudichaudi*, Valenciennes. = *Corb. recurvata*.  
*C. Gauritziana*, Krauss. = *Corb. Africana*.  
*C. globulus*, Jonas. = *Corb. cuneata*.  
*C. impressa*, Deshayes. = *C. eximia*.  
*C. inflata*, Deshayes. = *C. Panamensis*.  
*C. Islandica*, Férussac, undescribed.  
*C. Jayensis*, Lea. = *B. Jayana*.  
*C. Keraudrenii*, Lesson. = *B. Keraudrenii*.  
*C. Largillierti*, Philippi. = *Corb. Largillierti*.

- C. limosa*, Gray. = *Corb. limosa*.  
*C. mactroides*, Deshayes. = *C. mactriformis*.  
*C. Manillensis*, Philippi. = *Corb. Manillensis*.  
*C. Moquinianus*, Bourguignat. = *an Ancyclus*, typ. error.  
*C. nitens*, Philippi. = *Corb. nitens*.  
*C. obesa*, Hinds. = *B. obesa*.  
*C. orientalis*, Lamarck. = *Corb. orientalis*.  
*C. Paranacensis*, d'Orbigny. = *Corb. Paranensis*.  
*C. Peruviana*, Deshayes. = *C. anomala*.  
*C. Petitianus*, Bourguignat. = *an Ancyclus*, typ. error.  
*C. Philippinarum*, Hanley. = *B. Philippinarum*.  
*C. pulchella*, Mousson. = *Corb. pulchella*.  
*C. pullata*, Philippi. = *Corb. pullata*.  
*C. purpurea*, Lea. = *Venus gemma*.  
*C. pusilla*, Parreys. = *Corb. pusilla*.  
*C. radiata*, Parreys. = *Corb. radiata*.  
*C. Raymondi*, Bourguignat. = *an Ancyclus*, typ. error.  
*C. recurvata*, Valenciennes. = *Corb. recurvata*.  
*C. regulata*, Gassies. = *B. tenebrosa*.  
*C. rivalis*, v. d. Busch. = *Corb. rivalis*.  
*C. rotundata*, Lea. = *B. rotundata*.  
*C. similis*, Gray. = *Corb. Woodiana*.  
*C. solida*, Philippi. = *C. Nicaraguana*.  
*C. subquadrata*, Deshayes. = *C. California*.  
*C. subradiata*, Kurr. = *Corb. subradiata*.  
*C. tenebrosa*, Hinds. = *B. tenebrosa*.  
*C. trigonella*, Lamarck. = *Corb. trigonella*.  
*C. turgida*, Lea. = *C. Bengalensis*.  
*C. variegata*, D'Orbigny. = *Corb. limosa*.  
*C. violacea*, Lamarck. = *B. violacea*.  
*C. Woodiana*, Lea. = *Corb. Woodiana*.

Genus **SPHÆRIUM**, Scopoli.

Scopoli, Introduct. 397, 1777.

- Chama*, d'Argenville, Hist. Nat. Lithol. Conchyl. 368, 374,  
 pl. xxxi, No. 9, 1742.  
*Tellina*, Linnæus, Linn. Syst. Nat. x, edit. I, 678, 1758.  
*Cardium*, Dacosta, Brit. Conch. 173, pl. xiii, f. 2, 1778.  
*Cyclas*, Bruguière, Encycl. Méth. pl. 301, 1792.  
*Nux*, Humphrey, Mus. Calonn. 59, 1797.  
*Musculium*, Link., Coll. Univ. Bostock. pt. iii, 151, 1807.  
*Cornea*, Megerle, Mag. Gesell. Naturf. Berlin, v. 56, 1811.  
*Corneocyclas*, Férussac, Dict. Sci. Nat. xii, 277, 1818.  
*Amesoda*, Rafinesque, Ann. Gen. Sci. Phys. et Nat. v. 310,  
 1820.

*Cycladites*, Krüger, Gesch. Urwelt. ii, 469, 1823.

*Pisidium*, Verany, Descriz. Genova ii, 1846.

**1. Sph. Argentinum**, D'Orbigny.

*Cyclas Argentina*, D'Orbigny, Mag. Zool. 1835, 568, pl. 83, f. 5-7, 1844.

*Sph. Argentinum*, D'Orbigny, Brit. Mus. Cat. Conchif. 272, 1854. Proc. Ac. N. S. Phila. 31, 1862. Smith Inst. Misc. Coll., Prime Monog. Corb. 52, 1865.

Montevideo, S. America.

**2. Sph. aureum**, Prime.

*Cyclas aurea*, Prime, Proc. Soc. N. H. Bost. iv, 159, 1851.

*Sph. aureum*, Prime, Brit. Mus. Cat. Conchif. 268, 1854. Proc. Ac. N. S. Phila., 404, 1861. Prime, Cat. Corb. 9, 1863. Smith. Inst. Misc. Coll., Prime Monog. Corb. 35, f. 26, 1865.

Lake Superior, U. S. of America.

**3. Sph. Bahiense**, Spix.

*Cylas Bahiensis*, Spix. Test. Bras. 32, pl. xxv. f. 5, 6, 1827. Mem. Soc. Phys. H. N. Geneva, vii, 414, 1836.

*Cyclas maculata*, Anton. (non Morelet), Wieg. Archiv. 284, 1837.

*Pisum maculatum*, Deshayes, Brit. Mus. Cat. Conchif. 283, 1854.

*Pisum Bahiense*, Deshayes, loc. sup. cit. 284, 1854.

*Musculium Bahiense*, H. and A. Adams, Gen. Rec. Moll. ii, 451, 1858.

*Musculium maculatum*, H. and A. Adams, loc. sup. cit. ii, 451, 1858.

*Sph. Bahiense*, Spix, Proc. Ac. N. S. Phila. 32, 1862. Prime, Cat. Corb. 12, 1863. Smith. Inst. Misc. Coll., Prime Monog. Corb. 53, f. 52, 1865.

Bahia, Brazil.

**4. Sph. Barbadense**, Prime, Proc. A. N. S. Phila. 415, 1861.

Prime, Cat. Corb. 12, 1863, Smith. Inst. Misc. Coll., Prime, Monog. Corb. 53, f. 53, 1865.

Barbadoes, W. Indies.

**5. Sph. Brochonianum**, Bourguignat, Mem. Soc. Sc. phys. et. nat. Bord. i, 1854.

*Cyclas Corsa*, Charpentier, in litt.

France.

**6. Sph. Capense**, Krauss.

*Cyclas Capensis*, Krauss, Moll. S. A. 7, pl. 1, fig. 6, 1848.

*Sph. Capense*, Krauss, Brit. Mus. Cat. Conchif. 265, 1854.

Cape of Good Hope, Africa.

- 7. Sph. contractum**, Prime, Cat. Corb. ii, 1863.  
Smith. Inst. Misc. Coll., Prime Monog. Corb. 48, f. 46,  
1865. *Alabama, U. S. of America.*
- 8. Sph. Cooperianum**, Prime, in litt. *California.*
- 9. Sph. corneum**, Scopoli.  
*Chama cinerea*, d'Argenville, Hist. nat. Lithol. Conch. 2d  
edit. 326, 321, pl. xxvii, f. 9, 1742.  
*Tellina cornea*, Linnaeus, Syst. Nat. x, edit. i, 678, 1758.  
*Tellina rivalis*, Müller, Verm. ii, 202, 1774.  
*Sphaerium corneum*, Scopoli, Introduct. 397, 1777.  
*Cardium nux*, Dacosta, Brit. Conch. 173, pl. xiii, f. 2-2,  
1778.  
*Nux nigella*, Humphrey, Mus. Calonn. 59, 1797.  
*Cardium amnicum*, Pultney, Cat. Dorset. 31, 1799.  
*Cyclas cornea*, Draparnaud, Tabl. Moll. 195, 1801.  
*Cardium corneum*, Montagu, Test. Brit. 86, 1803.  
*Cyclas rivalis*, Draparnaud, Hist. Moll. 129, pl. x, f. 4, 5,  
1805.  
*Cornea communis*, Megerle, Mag. Gesell. Naturf. Berlin, v,  
56, 1811.  
*Cyclas alata*, Leach, in litt. in Mus. Brit. 1818-19-20.  
*Cyclas stagnicola*, Leach, in litt. in Mus. Brit. 1818-19-20.  
*Cycladites corneus*, Krüger, Gesch. Urvwelt. ii, 469, 1823.  
*Cyclas fossarum*, Krynicki, in litt. 183—  
*Cyclas nucleus*, Studer, Nouv. Mem. Soc. Helv. Sc. Nat. i, 25,  
1837.  
*Cyclas tumida*, Zeigler, in litt. Féruss. Cat. 20, 1837.  
*Cyclas Leachii*, Zeigler, in litt. Villa. Cat. 44, 1841.  
*Cyclas plumbeus*, Villa., loc. sup. cit. 44, 1841.  
*Cyclas citrina*, Brown, Illust. Conch. Gr. Brit. etc. 93, pl.  
xxxix, f. 19, 1842.  
*Cyclas flavescens*, Macgillivroy, Hist. Moll. An. 208, 246,  
1843.  
*Pisidium cornea*, Verany, Descriz. Genova, ii, 1846.  
*Cyclas isocardioides*, Normand, Dupuy, Hist. Moll. Fr. 668,  
1852.  
*Sph. corneum*, Scopoli, Mem. Soc. Sc. phys. et nat. Bord. 1.  
1854. Prime, Cat. Corb. 12, 1863. *Europe.*
- 10. Sph. Creplini**, Dunker.  
*Cyclas Creplini*, Dunker, Zeit. Malak. 20, 1845.  
*Pisum Creplini*, Deshayes, Brit. Mus. Cat. Conchif. 280,  
1854.  
*Sph. Creplini*, Dunker, Normand. Cycl. Dépt. Nord. 3, 1854.

- Musculium Creplini*, Dunker, H. and A. Adams, gen. rec. Moll. ii, 451, 1858.  
*Sph. Creplini*, Dunker, Prime, Cat. Corb. 12, 1863. *Europe.*
- 11. Sph. Cubanum**, Prime, Cat. Corb. 12, 1863.  
 Smith. Inst. Misc. Coll., Prime Monog. Corb. 58, f. 60, 1863. *Cuba, W. Indies.*
- 12. Sph. dingoli**, Bivona.  
*Cyclas dingoli*, Bivona, Gior. Sci. Lett. ed. Arte. Palermo. lxvi, 221, 1839.  
*Pisidium dingoli*, Bivona, Villa, Cat. 44, 1841. *Brit. Mus. Cat. Conchif. 285, 1854. Sicily.*
- 13. Sph. dentatum**, Haldeman.  
*Cyclas dentata*, Hald., Proc. Ac. N. S. Phila. i, 100, 1841. Proc. Soc. N. H. Bost. iv, 250, 1852.  
*Sph. dentatum*, Hald., Smith. Inst. Misc. Coll., Prime Monog. Corb. 40, fig. 32, 1865. *Oregon, U. S. of America.*
- 14. Sph. egregium**, Gould.  
*Cyclas egregia*, Gould, Proc. Soc. N. H. Bost. iii, 292, 1850. U. S. Explor. Expedit. xii, 425, f. 526, 1852. *Oceanica.*
- 15. Sph. elevatum**, Haldeman.  
*Cyclas elevata*, Hald., Proc. Acad. N. S. Phila. 1, 53, 1841, N. H. N. Y. v, 224, 1843.  
*Cyclas pallida*, de Charpentier, in litt, 1851.  
*Sph. elevatum*, Hald., Brit. Mus. Cat. Conchif. 269, 1854. Prime, Cat. Corb. 10, 1863. Smith. Inst. Misc. Coll., Prime Monog. Corb. 44, f. 41, 1865. *U. S. of America.*
- 16. Sph. emarginatum**, Prime.  
*Cyclas emarginata*, Prime, Proc. Soc. N. H. Bost. iv, 156, 1851.  
*Sph. emarginatum*, Prime, Brit. Mus. Cat. Conchif. 267, 1854. Prime, Cat. Corb. 10, 1863. Smith. Inst. Misc. Coll., Prime Monog. Corb. 43, f. 38, 1865. *U. S. of America.*
- 17. Sph. fabale**, Prime.  
*Cyclas fabalis*, Prime, Proc. Soc. N. H. Bost. iv, 159, 1851.  
*Cyclas castanea*, Prime, loc. sup. cit. iv, 160, 1851.  
*Cyclas sulculosa*, de Charpentier, in litt. 1851.  
*Sph. castaneum*, Prime, Brit. Mus. Cat. Conchif. 270, 1854.  
*Sph. fabale*, Prime, loc. sup. cit. 269, 1854. Prime, Cat. Corb. 10, 1863. Smith. Inst. Misc. Coll., Prime Monog. 40, f. 33, 1865. *U. S. of America.*

**18. Sph. ferrugineum, Krauss.***Cyclas ferruginea*, Krauss, Moll. S. A. 7, pl. 1, fig. 7, 1848.*Pisidium parasiticum*, Parreys, in litt.*Pisum ferrugineum*, Krauss, Brit. Mus. Cat. Conchif. 281, 1854.*Pisum parasiticum*, Parreys, loc. sup. cit. 280, 1854.*Musculium parasiticum*, Parreys, H. and A. Adams, gen. rec. Moll. ii, 452, 1854.*Musculium ferrugineum*, Krauss, loc. sup. cit. ii, 451, 1858.*South Africa.***19. Sph. flavum, Prime.***Cyclas flava*, Prime, Proc. Soc. N. H. Bost. iv, 155, 1851.*Sph. flavum*, Prime, Brit. Mus. Cat. Conchif. 268, 1854.

Prime, Cat. Corb. 10, 1863. Smith. Inst. Misc. Coll.,

Prime Monog. Corb. 43, f. 39, 1865.

*U. S. of America.***20. Sph. inconspicuum, Prime, Proc. Zool. Lond. xxviii, 322, 1860.***Asia Minor.***21. Sph. Indicum, Deshayes, Proc. Zool. Lond. xxii, 342, 1854.**

Brit. Mus. Cat. Conchif. 265, 1854.

*East Indies.***22. Sph. Jayanum, Prime.***Cyclas Jayensis*, Prime, Proc. Soc. N. H. Bost. iv, 157, 1854.*Sph. Jayanum*, Prime. Prime, Cat. Corb. 11, 1863. Smith.

Inst. Misc. Coll., Prime Monog. Corb. 46, 47, f. 43, 1865.

*U. S. America.***23. Sph. Jeannoti, Normand, Cycl. Dépt. Nord. 2, 1854.**

Prime, Cat. Corb. 13, 1863.

*France.***24. Sph. lacustre, Férussac.***Tellina lacustris*, Müller, Verm. ii, 204, 1774.*Cardium lacustre*, Montagu, Test. Brit. 89, 1803.*Cyclas calyculata*, Draparnaud, Hist. Moll. 130, pl. x, f. 14, 15, 1805.*Musculium lacustre*, Link., Coll. Univ. Rostock, Part iii, 152, 1807.*Cyclas lacustris*, Férussac, Méth. Conchyl. 128, 1807.*Tellina tuberculata*, Alten, System, Abhandl. 4, pl. 1, f. 1, 1812.*Tellina tenera*, Schrank, Ann. Wetterau. 316, 1814.*Cyclas tuberculata*, Klees, Dissert. Tubing. 45, 1818.*Tellina stagnicola*, Shephard, Trans. Linn. Soc. Lond. xiv, 150, 1823.*Sph. lacustre*, Bourguignat, Rev. Mag. Zool. 345, 1853.

Brit. Mus. Cat. Conchif. 262, 1854.



- Cyclas Perczeii*, Villa, in litt. 1854.  
*Sph. lacustre*, Férussac, Prime, Cat. Corb. 13, 1863. *Europe.*
- 25. *Sph. lenticula*, Gould.**  
*Lucina lenticula*, Gould, Proc. Soc. N. H. Bost. iii, 256, 1850.  
*Cyclas lenticula*, Gould, U. S. Explor. Expedit. xii, 413, pl. xxxvi, f. 528, 1852.  
*Sph. lenticula*, Gould, Proc. Ac. N. S. Phila. 36, 1862.  
 Prime, Cat. Corb. 11, 1863. Smith. Inst. Misc. Coll.,  
 Prime Monog. Corb. 51, f. 51, 1865. *California.*
- 26. *S. maculatum*, Morelet.**  
*Cyclas maculata*, Morelet, Test. Nov. 25, 1851.  
*S. maculatum*, Morelet, Proc. Acad. N. S. Phila. 33, 1862.  
 Prime, Cat. Corb. 11, 1863. Smith. Inst. Misc. Coll.,  
 Prime Monog. Corb. 55, f. 55, 1865. *Yucatan, Mexico.*
- 27. *S. Madagascariense*, Tristram,** Proc. Zool. Lond. 61, 1863. *Near Antanarivo, Madagascar.*
- 28. *S. Modioliforme*, Anton.**  
*Cyclas modioliiformis*, Anton, Wieg. Archiv. 228, 1837.  
*Pisidium diaphanum*, Haldeman, Proc. Ac. N. S. Phila. i, 53, 1841.  
*Pisum Modioliforme*, Deshayes, Brit. Mus. Cat. Conchif. 283, 1853.  
*Pisidium Moquinianum*, Bourguignat, Rev. Mag. Zool. — 1855.  
*Cyclas Moquiniana*, Gassies, Act. Soc. Linn. Bord, xx, — 1855.  
*Cyclas striatella*, Férussac, Museum of Paris.  
*Cyclas littoralis*, Férussac, Cabinet of Michaud, Lyons.  
*Cyclas Venezuelensis*, Prime, Museum of Leyden.  
*Musculium Modioliforme*, H. and A. Adams, gen. rec. Moll. ii, 451, 1858.  
*S. Modioliforme*, Anton, Proc. Ac. N. S. Phila. 32, 1862.  
 Smith. Inst. Misc. Coll., Prime Monog. Corb. 54, 1865. *South America.*
- 29. *S. nobile*, Gould.**  
*Cyclas nobilis*, Gould, Proc. Soc. N. H. Bost. v, 229, 1855.  
 U. S. Explor. Expedit. xii, 426, pl. xxxvi, f. 527, 1852.  
*S. nobile*, Gould, Proc. Ac. N. S. Phila. 407, 1861. Prime,  
 Cat. Corb. 10, 1863. Smith. Inst. Misc. Coll., Prime  
 Monog. Corb. 41, f. 35, 1865. *U. S. of America.*
- 30. *S. Novæ-Zelandiæ*, Deshayes,** Proc. Zool. Lond. xxii, 342, 1854.  
 Brit. Mus. Cat. Conchif. 272, 1854. *New Zealand and New Holland.*

**31. *S. occidentale*, Prime.**

*Cyclas ovalis* (preoc), Prime, Proc. Soc. N. H. Bost. iv, 276, 1852.

*Cyclas occidentalis*, Prime, loc. sup. cit. v, 122, 1855.

*S. ovale*, Stimpson, H. and A. Adams, Gen. Rec. Moll. ii, 450, 1858.

*S. occidentale*, Prime, Proc. Ac. N. S. Phila. 407, 1861.  
Prime, Cat. Corb. 10, 1863. Smith. Inst. Misc. Coll.,  
Prime Monog. Corb. 41, f. 34, 1865. *U. S. of America.*

**32. *S. ovale*, Férussac.**

*Cyclas lacustris*, Draparnaud, Hist. Moll. 130, pl. x, f. 6, 7, 1805.

*Cyclas ovalis*, Férussac, Méth. Conchyl. 128, 136, 1807.

*Cyclas consobrina*, Férussac, Dict. Sci. Nat. xii, 279, 1818.

*S. Deshayesianum*, Bourguignat, Rev. Mag. Zool. 345, 1853.

*S. ovale*, Férussac, Mem. Soc. Sc. Phys. Bord. i, 1854.

*S. consobrinum*, Férussac, Brit. Mus. Cat. Conchif. 263, 1854.

*S. pallidum*, Gray, Ann. Mag. N. H. 2d ser. xvii, 465, 1856.

*S. ovale*, Férussac, Prime Cat. Corb. 12, 1863. *Europe.*

**33. *S. partumeium*, Say.**

*Cyclas cornea*, Lam., var. 2, An. v, 558, 1818.

*Cyclas partumeia*, Say, J. Ac. N. S. Phila. ii, 380, 1822.  
Gould, Invert. 73, f. 54, 1841.

*Cyclas orbicularia*, Barrat, Amer. J. Sci. xlviii, 276, 1845.

*Cyclas mirabilis*, Prime, Proc. Soc. N. H. Bost. iv, 157, 1851.

*Cyclas cærulea*, Prime, loc. sup. cit. iv, 161, 1851.

*S. partumeium*, Say, Brit. Mus. Cat. Conchif. 266, 1854.

*S. mirabile*, Prime, loc. sup. cit. 269, 1854.

*S. orbicularium*, Barrat, H. and A. Adams, Gen. Rec. Moll. ii, 450, 1858.

*S. cæruleum*, Prime, loc. sup. cit. ii, 450, 1858.

*S. partumeium*, Say, Proc. Ac. N. S. Phila. 29, 1862. Prime,  
Cat. Corb. 10, 1863. Smith. Inst. Misc. Coll., Prime  
Monog. Corb. 45, f. 42, 1865. *U. S. of America.*

**34. *S. patella*, Gould.**

*Cyclas patella*, Gould, Proc. Soc. N. H. iii, 292, 1850. *U. S.*  
Explor. Expedit. xii, 426, pl. xxxvi, f. 527, 1852.

*S. patella*, Gould, Brit. Mus. Cat. Conchif. 271, 1854. Prime  
Cat. Corb. 10, 1863. Smith. Inst. Misc. Coll., Prime  
Monog. Corb. 42, f. 36, 1865. *Oregon, U. S. of America.*

**35. *S. perpusillum*, Gärtner.**

*Cyclas perpusilla*, Gärtner, Ann. Wetterau. iii, 316.

*Pisum perpusillum*, Gärtner, Brit. Mus. Cat. Conchif. 285,  
1854 *Hanover, Germany.*

**36. *S. rhomboideum*, Say.**

*Cyclas cornea*. Lam., var. 3, An. v. 558, 1818.

*Cyclas rhomboidea*, Say, J. Ac. N. S. Phila. ii, 380, 1822.

*Cyclas elegans*, C. B. Adams, J. N. H. Bost. iii, 330, pl. iii, f. 11, 1840. Gould, Invert. 74, f. 55, 1841. N. H. N. Y. v, 224, 1843.

*Cyclas rhomboidea*, Say, N. H. N. Y. v, 224, pl. xxv, f. 263, 1843. Ann. Lyc. N. H. N. Y. vi, 66, pl. 1, f. 4, 1853.

*S. rhomboideum*, Say, Brit. Mus. Cat. Conchif. 266, 1854.

*S. elegans*, C. B. Adams, loc. sup. cit. 270, 1854.

*S. rhomboideum*, Say, Prime Cat. Corb. 9, 1863. Smith. Inst. Misc. Coll., Prime Monog. Corb. 39, f. 31, 1865.

*U. S. of America.*

**37. *S. rivicola*, Lamarck.**

*Chama albida*, d'Argenville, Hist. Nat. Lithol. Conch. 368, pl. xxxi, f. 9, 1742.

*Tellina cornea* (pars), Schröter, Fluss. Conch. 189, pl. iv, f. 4, 1779.

*Cyclas cornea*, (pars), Draparnaud, Tabl. Moll. 105, var. a, 1801.

*Cyclas rivicola*, Lamarck, An. v, 558, 1818.

*Cyclas sabulicola*, Krynicki, in litt. 183—

*Cyclas æquata*, junior, Sheppard, in litt. 1840.

*S. riviculum*, Leach, Mörch. Cat. Conch. 30, 1853.

*S. rivicola*, Lamarck, Rev. Mag. Zool. 345, 1853. Mem. Soc. Sc. Phys. et Nat. Bord. i, 1854. Brit. Mus. Cat. Conchif. 261. 1854. Prime Cat. Corb. 12, 1863. *Europe.*

**38. *S. rosaceum*, Prime.**

*Cyclas rosacea*, Prime, Proc. Soc. N. H. Bost. iv, 155, 1851.

*S. rosaceum*, Prime, Brit. Mus. Cat. Conchif. 270, 1854. Prime, Cat. Corb. 11, 1863. Smith. Inst. Misc. Coll., Prime Monog. Corb. 50, f. 48, 1865.

*Schuylkill River, U. S. of America.*

**39. *S. Ryckholtii*, Normand.**

*Cyclas Ryckholtii*, Normand, Not. Cycl. Valenc. 7, f. 5, 6, 1844.

*S. Ryckholtii*, Normand, Rev. Mag. Zool. 345, 1853.

*S. strictum*, Normand, Cycl. Dépt. Nord. 3, 1854.

*S. Ryckholtii*, Normand, Prime Cat. Corb. 12, 1863. *France.*

**40. *S. Scaldianum*, Normand.**

*Cyclas Scaldiana*, Normand, Not. Cycl. Valenc. 5, f. 1, 2, 1844.

*S. corneum* (pars), Bourguignat, Rev. Mag. Zool. 345, 1853.

*S. citrinum*, Normand, Cycl. Dépt. Nord. 1, 1854.

*S. Scaldianum*, Normand, Mem. Soc. Sc. Phys. et Nat. Bord.  
i, 1854. Prime Cat. Corb. 12, 1863. *Europe.*

**41. *S. securis*, Prime.**

*Cyclas securis*, Prime, Proc. Soc. N. H. Bost. iv, 160, 1851.

*Cyclas cardissa*, Prime, loc. sup. cit. iv, 160, 1851.

*Cyclas securis*, Prime, Ann. Lyc. N. H. N. Y. v, 218, pl. vi,  
1852.

*Cyclas crocea*, Lewis, Proc. Soc. N. H. Bost. v, 25, 1854.

*S. cardissa*, Prime, Brit. Mus. Cat. Conchif. 268, 1854.

*S. securis*, Prime, loc. sup. cit. 268, 1854. Prime Cat. Corb.  
11, 1863. Smith. Inst. Misc. Coll., Prime Monog. Corb.  
49, f. 47, 1865. *U. S. of America.*

**42. *S. simile*, Say.**

*Cyclas similis*, Say, Nichols. Encycl. 1st Amer. edit. ii, pl. 1,  
f. 9, 1817.

*Cyclas sulcata*, Lamarck, An. v, 560, 1818.

*Cyclas Sarratogea*, Lamarck, loc. sup. cit. v, 560, 1818.

*Cyclas lasmampsis*, Rafinesque, Ann. gen. Sci. phys. et nat.  
v, 319, pl. lxxxii, f. 19, 20, 1820.

*Cyclas striatula*, Lamarck, Férussac, Mag. Zool. 1835.

*Cyclas sulcata*, Lamarck, Delessert, Recueil, pl. vii, f. 3, 1841.

*Cyclas Sarratogea*, Lamarck, loc. sup. cit. pl. vii, f. 9, 1841.

*Cyclas similis*, Say, Gould Invert. 72, f. 53, 1831.

*Cyclas rhomboidea*, Say, C. B. Adams, Vermont, 18, 1842.

*Cyclas solida*, DeKay, N. H. N. Y. v, 229, pl. xxv. f. 265,  
1843.

*Cyclas gigantea*, Prime, Proc. Soc. N. H. Bost. iv, 157, 1851.

*Cyclas ponderosa*, Prime, Proc. Soc. N. H. Bost. iv, 157, 1851.

*S. simile*, Say, Brit. Mus. Cat. Conchif. 265, 1854.

*S. giganteum*, Prime, loc. sup. cit. 267, 1854.

*S. ponderosum*, Prime, loc. sup. cit. 268, 1854.

*S. sulcatum*, Lamarck, Prime Cat. Corb. 8, 1863. Smith.  
Inst. Misc. Coll., Prime Monog. Corb. 33, f. 25, 1865.  
*North America.*

**43. *S. solidulum*, Prime.**

*Cyclas solidula*, Prime, Proc. Soc. N. H. Bost. iv, 158, 1851.

*Cyclas distorta*, Prime, loc. sup. cit. iv. 158, 1851.

*S. solidulum*, Prime, Brit. Mus. Cat. Conchif. 269, 1854.

*S. distortum*, Prime, loc. sup. cit. 271, 1854.

*S. solidulum*, Prime, Cat. Corb. 9, 1863. Smith. Inst. Misc.  
Coll., Prime Monog. Corb. 36, f. 27, 1865.

*U. S. of America.*

**44. *S. solidum*, Normand.**

*Cyclas solida*, Normand, Not. Cycl. Valenc. 6, f. 3, 4, 1844.

- S. solidum*, Normand, Rev. Mag. Zool. 345, 1853. Mem. Soc. Sci. Phys. Bord. i, 1854. Prime Cat. Corb. 12, 1863. *Europe.*
- 45. *S. sphæricum*, Anthony.**  
*Cyclas sphærica*, Anthony, Proc. Bost. Soc. N. H. Bost. iv, 275, 1852.  
*Sph. sphæricum*, Anthony, H. and A. Ad., Gen. Rec. Moll. ii, 450, 1858. Prime Cat. Corb. 11, 1863. Smith. Inst. Misc. Coll., Prime Monog. Corb. 50, f. 49, 1865. *U. S. of America.*
- 46. *S. stamineum*, Conrad.**  
*Cyclas staminea*, Conrad, Amer. J. Sci. xxv, 342, pl. 1, f. 5, 1834.  
*C. clas fuscata*, Rafinesque, Prime in Proc. Soc. N. H. Bost. iv, 281, 1852.  
*Cyclas bulbosa*, Anthony, loc. sup. cit. iv, 283, 1852.  
*Sph. stamineum*, Conrad, Brit. Mus. Cat. Conchif. 267, 1854. Prime Cat. Corb. 9, 1863. Smith. Inst. Misc. Coll., Prime Monog. Corb. 38, f. 30, 1865. *U. S. of America.*
- 47. *S. Steinii*, Schmidt.**  
*Cyclas Steinii*, Schmidt, Zeit. Malak. 118, 1850.  
*Sph. Steinii*, Schmidt, H. and A. Ad., Gen. Rec. Moll. ii, 450, 1858. *Germany.*
- 48. *S. striatinum*, Lamarck.**  
*Cyclas striatina*, Lamarck, An. v. 560, 1818.  
*Cyclas edentula*, Say, N. Harm. Dissem. 356, 1829.  
*Cyclas striatina*, Lamarck, Delessert. Recueil. pl. vii, f. 4, 1841.  
*Cyclas cornea*, C. B. Adams, Cat. 29, 1847.  
*Cyclas albula*, Prime, Proc. Soc. N. H. Bost. iv, 155, 1851.  
*Cyclas tenuistriata*, Prime, loc. sup. cit. iv, 156, 1851.  
*Cyclas acuminata*, Prime, loc. sup. cit. iv, 158, 1851.  
*Cyclas inornata*,  
*Cyclas simplex*,  
*Cyclas modesta*,  
 } Prime, loc. sup. cit. iv, 159, 1851.  
*Sph. tenuistriatum*, Prime, Brit. Mus. Cat. Conchif. 267, 1854.  
*Sph. albulum*, Prime, loc. sup. cit. 269, 1854.  
*Sph. inornatum*, Prime, loc. sup. cit. 270, 1854.  
*Sph. neodestum*, Prime, loc. sup. cit. 270, 1854.  
*Sph. simplex*, Prime, loc. sup. cit. 271, 1854.  
*Sph. acuminatum*, Prime, loc. sup. cit. 271, 1854.  
*Pisum edentulum*, Say, loc. sup. cit. 282, 1854.  
*Musculium edentulum*, Say, H. and A. Ad., Gen. Rec. Moll. ii, 450, 1858.



- Sph. striatinum*, Lamarek, Proc. Ac. N. S. Phila. 405, 1861.  
 Prime Cat. Corb. 9, 1863. Smith. Inst. Misc. Coll.,  
 Prime Monog. Corb. 37, f. 29, 1865. *North America.*
- 49. S. subtransversum**, Prime, Proc. Zool. Lond. xxviii,  
 322, 1860. Smith. Inst. Misc. Coll., Prime Monog.  
 Corb. 52, 1865. *Mexico.*
- 50. S. tenue**, Prime.  
*Cyclas tenuis*, Prime, Proc. Soc. N. H. Bost. iv, 161, 1851.  
*Sph. tenue*, Prime, H. and A. Ad., Gen. Rec. Moll. ii, 450,  
 1858. Prime Cat. Corb. 11, 1863. Smith. Inst. Misc.  
 Coll., Prime Monog. Corb. 17, f. 44, 1865.  
*U. S. of America.*
- 51. S. Terverianum**, Dupuy.  
*Cyclas Terveriana*, Dupuy, extram. Gall. test. 87, 1849. Du-  
 puy Hist. Moll. Tr. 674, pl. xxix, f. 9, 1852.  
*S. Terverianum*, Dupuy, Rev. Mag. Zool. 135, 1853, Mem.  
 Soc. Sc. Phys. Bord. i, 1854. Prime, Cat. Corb. 12,  
 1863. *France.*
- 52. S. transversum**, Say.  
*Cyclas transversa*, Say, N. Harm. Dissem. 356, 1829.  
*Cyclas detruncata*, Prime, Proc. Soc. N. H. Bost. iv, 155,  
 1851.  
*Cyclas gracilis*, Prime, Loc. sup. cit. iv, 156, 1851.  
*Cyclas constricta*, Anthony, Loc. sup. cit. iv, 274, 1852.  
*Sph. transversum*, Say, Brit. Mus. Cat. Conchif. 267, 1854.  
*Sph. gracile*, Prime, Loc. sup. cit. 268, 1854.  
*Sph. detruncatum*, Prime, Loc. sup. cit. 272, 1854.  
*Sph. transversum*, Say, Proc. Ac. N. S. Phila. 31, 1862.  
 Prime, Cat. Corb. 11, 1863. Smith Inst. Misc. Coll.,  
 Prime Monog. Corb. 48, f. 45, 1865. *U. S. of America.*
- 53. S. triangulare**, Say.  
*Cyclas triangularis*, Say, N. Harm. Dissem. 356, 1829.  
*Sph. triangulare*, Say, Proc. Ac. N. S. Phila. 28, 1862.  
 Smith. Inst. Misc. Coll., Prime Monog. Corb. 36, f. 28,  
 1865. *Mexico.*
- 54. S. truncatum**, Linsley.  
*Cyclas calyculata*, Draparnaud, C. B. Ad., Amer. J. Sci. xl,  
 277, 1841. C. B. Ad., Vermont, 18, 1842. C. B. Ad.,  
 Cat. 29, 1847.  
*Cyclas truncata*, Linsley, Amer. J. Sci. n. ser. vi, 234, f. 3,  
 1848.  
*Cyclas pellucidea*, Prime, Stimp. Moll. N. E. 16, 1851.



- Sph. pellucidum*, Prime, H. & A. Ad., Gen. Rec. Moll. ii, 450, 1858.
- Sph. truncatum*, Linsley, Proc. Ac. N. S. Phila. 35, 1862.  
Prime, Cat. Corb. 11, 1863. Smith. Inst. Misc. Coll.,  
Prime Monog. Corb. 51, f. 50, 1865. *U. S. of America.*
- 55. *S. Veatleyii***, C. B. Adams.  
*Cyclas Veatleyii*, C. B. Adams, Contr. Conch. 44, 1849.  
*Pisidium Veatleyii*, Petit, J. Conch. ii, 421, 1851.  
*Pisum Veatleyii*, C. B. Adams, Brit. Mus. Cat. Conchif. 283,  
1854.  
*Musculium Veatleyii*, C. B. Adams, H. & A. Ad. Gen. Rec.  
Moll. ii, 452, 1858.
- Sph. Veatleyii*, C. B. Adams, Proc. Ac. N. S. Phila. 34, 1862.  
Prime, Cat. Corb. 12, 1863. Smith. Inst. Misc. Coll.,  
Prime Monog. Corb. 56, f. 56, 1865.
- Jamaica, W. Indies.*

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TO BE EXCLUDED.

- Sph. acuminatum*, Prime. = *Sph. striatinum*.  
*Cyclas acuta*, Pfeiffer. = *P. Henslowianum*.  
*Cyclas æqualis*, Rafinesque. = *P. Virginicum*.  
*Cyclas æquata*, Sheppard. = *Sph. rivicola*.  
*Cyclas alata*, Leach. = *Sph. corneum*.  
*Sph. album*, Prime. = *Sph. striatinum*.  
*Cyclas altilis*, Anthony. = *P. compressum*.  
*Cyclas Americana*, Christofori & Jan.; undescribed.  
*Cyclas amnicæ*, Turton. = *P. amnicum*.  
*Cyclas appendiculata*, Turton. = *P. Henslowianum*.  
*Cyclas Australis*, Lamarek. = *Corb. Australis*.  
*Cyclas Bengalensis*, Férussac. = *C. Bengalensis*.  
*Cyclas borealis*, Lamarek. = *Corb. borealis*.  
*Cyclas calyculata*, Draparnaud. = *Sph. lacustre*.  
*Sph. cardissum*, Prime. = *Sph. securis*.  
*Cyclas Caroliniana*, Bosc. = *C. Caroliniensis*.  
*Sph. castaneum*, Prime. = *Sph. fabale*.  
*Cyclas Chilensis*, D'Orbigny. = *P. Chilense*.  
*Cyclas Chinensis*, Lamarek. = *Corb. fluminea*.  
*Cyclas cinerea*, Hanley. = *P. casertenum*.  
*Cyclas citrina*, Brown. = *Sph. corneum*.  
*Sph. citrinum*, Normand. = *Sph. Scaldianum*.  
*Cyclas clandestina*, DaCosta.; a marine shell.  
*Sph. coeruleum*, Prime. = *Sph. partumeium*.  
*Cyclas consobrina*, Cailliaud. = *Corb. consobrina*.

- Sph. consobrinum*, Férussac. = *Sph. ovale*.  
*Sph. constrictum*, Anthony. = *Sph. transversum*.  
*Cyclas Corsa*, Charpentier. = *Sph. Brochonianum*.  
*Cyclas crocea*, Lewis. = *Sph. securis*.  
*Cyclas Cychkolzii*, Bientina; undescribed.  
*Cyclas Cyrænopsis*, Valenciennes. = *Corb. Cyrænopsis*.  
*Sph. detruncatum*, Prime. = *Sph. transversum*.  
*Sph. Deshayesianum*, Bourguignat. = *Sph. ovale*.  
*Cyclas diaphana*, Prime. = *Sph. modioliforme*.  
*Sph. distortum*, Prime. = *Sph. solidulum*.  
*Cyclas dubia*, Say. = *P. Virginicum*.  
*Cyclas dubiosa*, Say. = *P. Virginicum*.  
*Cyclas duplicata*, Pfeiffer. = *P. duplicatum*.  
*Cyclas Dupontia*, Férussac. = *Cyrenella Dupontia*.  
*Sph. eburneum*, Anthony. = *Sph. partumeum*.  
*Cyclas edentula*, Say. = *Sph. striatinum*.  
*Cyclas elegans*, C. B. Adams. = *Sph. rhomboideum*.  
*Cyclas errans*, Lewis.; undescribed.  
*Cyclas elliptica*, Férussac.; undescribed.  
*Cyclas Euphratica*, Lamarck = *Corb. fluminalis*.  
*Cyclas flavescens*, McGillivray = *Sph. corneum*.  
*Cyclas fluminea*, Bosc.; undescribed.  
*Cyclas fluviatilis*, Bosc.; undescribed.  
*Cyclas Fontaineii*, D'Orbigny. = *C. Fontaineii*.  
*Cyclas fontinalis*, Draparnaud. = *P. pusillum*.  
*Cyclas fossarum*, Krynicki. = *Sph. corneum*.  
*Sph. fuscum*, Rafinesque. = *Sph. striatinum*.  
*Cyclas gibba*, Alder. = *P. obtusale*.  
*Sph. giganteum*, Prime. = *Sph. simile*.  
*Cyclas globosa*, Megerle. = *Sph. corneum*.  
*Sph. gracile*, Prime. = *Sph. transversum*.  
*Cyclas hammalis*, Rafinesque; undescribed.  
*Euglesa Henslowiana*, Leach; a *Sphærium*.  
*Cyclas hermaphrodita*, Mart. = *Galathea radiata*.  
*Sph. Herminii*, Wäld. = *P. casertanum*.  
*Sph. inornatum*, Prime. = *Sph. striatinum*.  
*Cyclas Islandica*, Lamarck. = *Cyprina Islandica*.  
*Cyclas isocardioides*, Normand. = *Sph. corneum*.  
*Cyclas lacustris*, Draparnaud. = *Sph. ovale*.  
*Cyclas lævigata*, Schumacker, is *Corb* ?  
*Cyclas lasmampsis*, Rafinesque. = *Sph. simile*.  
*Cyclas Leachii*, Ziegler. = *Sph. corneum*.  
*Cyclas lenticularis*, Normand. = *P. casertanum*.  
*Cyclas limosa*, D'Orbigny. = *Corb. limosa*.  
*Cyclas littoralis*, Férussac. = *Sph. modioliforme*.

- Cyclas lutea*, Ziegler. = *Sph. corneum*.  
*Cyclas maculata*, Anton. = *Sph. Bahiense*.  
*Cyclas maritima*, D'Orbigny. = *C. Cubana*.  
*Cyclas minor*, C. B. Adams. = *P. abditum*.  
*Cyclas minima*, Studer. = *P. obtusale*.  
*Sph. mirabile*, Prime. = *Sph. partumeium*.  
*Sph. modestum*, Prime. = *Sph. striatinum*.  
*Cyclas Moquiniana*, Gassies. = *Sph. modioliforme*.  
*Cyclas Nepeanensis*, Lesson. = *Corb. Nepeanensis*.  
*Cyclas nitida*, Hanley. = *P. abditum*.  
*Sph. nitidum*, C. B. Adams and Mighles. = *P. Adamsi*.  
*Cyclas nucleus*, Studer. = *Sph. corneum*.  
*Cyclas obliqua*, Lamarck. = *P. amnicum*.  
*Cyclas obtusalis*, Lamarck. = *P. obtusale*.  
*Sph. orbicularium*, Barrat. = *Sph. partumeium*.  
*Sph. ovale*, Stimpson. = *Sph. occidentale*.  
*Cyclas ovalis*, Nilsson. = *P. obtusale*.  
*Cyclas ovalis*, Prime. = *Sph. occidentale*.  
*Sph. ovatum*, Lewis; undescribed.  
*Cyclas pallida*, Charpentier. = *Sph. ovale*.  
*Cyclas palustris*, Draparnaud. = *P. amnicum*.  
*Cyclas Paranensis*, D'Orbigny. = *Corb. Paranensis*.  
*Sph. pellucidum*, Prime. = *Sph. truncatum*.  
*Cyclas Perezeii*, Villa. = *Sph. lacustre*.  
*Cyclas Pfeifferi*, Ziegler. = *P. amnicum*.  
*Sph. Pisidioides*, Gray. = *Sph. corneum*.  
*Cyclas plumbeus*, Villa. = *Sph. corneum*.  
*Sph. ponderosum*, Prime. = *Sph. simile*.  
*Sph. proximum*, Alder.; undescribed.  
*Cyclas pulchella*, Hanley. = *P. casertanum*.  
*Sph. pulchellum*, D'Orbigny. = *P. pulchellum*.  
*Cyclas punctifera*, Guppy. = *P. punctiferum*.  
*Cyclas pusilla*, Turton. = *P. pusillum*.  
*Sph. pygmeum*, C. B. Adams. = *P. Jamaicense*.  
*Cyclas quercus*, Lewis; undescribed.  
*Cyclas radiata*, Blainville. = *Galathea radiata*.  
*Cyclas rivalis*, Draparnaud. = *Sph. corneum*.  
*Cyclas rugosa*, Whittemore; undescribed.  
*Cyclas sabulicola*, Krynicki. = *Sph. rivicola*.  
*Cyclas Sarratogea*, Lamarck. = *Sph. simile*.  
*Sph. simplex*, Prime. = *Sph. striatinum*.  
*Cyclas solida*, De Kay. = *Sph. simile*.  
*Cyclas stagnicola*, Leach. = *Sph. corneum*.  
*Cyclas Steenbuchii*, Moller. = *P. Steenbuchii*.  
*Cyclas striatella*, Férussac. = *Sph. modioliforme*.

*Sph. strictum*, Normand. = *Sph. Ryckholtii*.  
*Sph. sulcatum*, Lamarck. = *Sph. simile*.  
*Cyclas sulculosa*, Charpentier. = *Sph. fabale*.  
*Cyclas Sumatrensis*, Férussac; undescribed.  
*Sph. tenuistriatum*, Prime. = *Sph. striatinum*.  
*Cyclas tuberculata*, Klees. = *Sph. lacustre*.  
*Cyclas tumida*, Ziegler. = *Sph. corneum*.  
*Cyclas variegata*, D'Orbigny. = *Corb. limosa*.  
*Cyclas Venezuelensis*, Prime. = *Sph. modioliforme*.  
*Cyclas Virginica*, Férussac. = *P. Virginicum*.  
*Cyclas violacea*, Lamarck. = *B. violacea*.  
*Cyclas vitrea*, Risso. = *P. casertanum*.  
*Cyclas Zeylanica*, Lamarck. = *C. Ceylonica*.  
*Sph. zonatum*, Prime; undescribed.

Genus **PISIDIUM**, C. Pfeiffer.

System. Anord., 1821.

*Tellina*, Müller, Verm. ii, 205, 1774.  
*Sphærium*, Scopoli, Introduct. 397, 1777.  
*Cardium*, Poli, Test. Sicil. i, 65, pl. xvi, f. 1, 1791.  
*Cyclas*, Draparnaud, Tabl. Moll. 106, 1801.  
*Pera*, *Cordula*, Leach, in litt. in Mus. Brit. 1818-20.  
*Physemoda*, Rafinesque, Ann. gen. Sc. phys. et nat. v, 319, 1820.  
*Gallileja*, Costa, Corrisp. Zool., 1839.  
*Pisum*, Gray (non Megerle), Proc. Zool. Lond. xv, 184, 1847.  
*Musculium*, Gray (non Link), 1851.  
*Pisum*, Deshayes (non Megerle), Brit. Mus. Cat. Conchif., 1854.  
*Musculium*, H. & A. Adams (non Link).  
*Pisum*, H. & A. Adams (non Megerle), Gen. Rec. Moll. ii, 1858.

1. **P. abditum**, Haldeman.

*Pisidium abditum*, Haldeman, Proc. Ac. N. S. Phila. 1, 53, 1841.  
*Cyclas minor*, C. B. Adams, Proc. Soc. N. H. Bost. 1, 48, 1841. J. N. H. Bost. iv, 39, pl. iv, f. 2, 1841.  
*Pisidium tenellum*, Gould, Ag. Lake Super. 245, 1848.  
*Pisidium minus*, Stimpson, Moll. N. E. 16, 1851.  
*Pisidium obscurum*, Prime, Proc. Soc. N. H. Bost. iv, 161, 1851.  
*Pisidium Kurtzi*, Prime, Loc. sup. cit. iv, 162, 1851.  
*Pisidium zonatum*, Prime, Loc. sup. cit. iv, 162, 1851.  
*Pisidium rubellum*, Prime, Loc. sup. cit. iv, 163, 1851.

*Pisidium regulare*, Prime, J. N. H. Bost. vi, 363, pl. xii, f. 11, 12, 1852.

*Pisidium notatum*, Prime, Loc. sup. cit. vi, 365, pl. xii. f. 20—22, 1852.

*Pisidium arcuatum*, Prime, Loc. sup. cit. vi, 364, pl. xii, f. 14—16, 1852.

*Pisum minus*, Deshayes, Brit. Mus. Cat. Conchif. 281, 1854.

*Pisum abditum*, Deshayes, Loc. sup. cit. 282, 1854.

*Pisidium resartum*, Ingalls in litt., 1855.

*Pisidium rubrum*, Lewis in litt., 1855.

*Pisidium plenum*, Lewis in litt., 1855.

*Musculium abditum*, H. & A. Adams, Gen. Rec. Moll. ii, 451, 1858.

*Musculium minus*, H. & A. Adams, Loc. sup. cit. ii, 451, 1858.

*Musculium rubellum*, H. & A. Adams, Loc. sup. cit. ii, 452, 1858.

*Musculium obscurum*, H. & A. Adams, Loc. sup. cit. ii, 452, 1858.

*Musculium Kurtzi*, H. & A. Adams, Loc. sup. cit. ii, 451, 1858.

*Musculium zonatum*, H. & A. Adams, Loc. sup. cit. ii, 452, 1858.

*Pisum obscurum*, H. & A. Adams, Loc. sup. cit. ii, 660, 1858.

*Pisum Kurtzi*, H. & A. Adams, Loc. sup. cit. ii, 660, 1858.

*Pisum rubellum*, H. & A. Adams, Loc. sup. cit. ii, 660, 1858.

*Pisum zonatum*, H. & A. Adams, Loc. sup. cit. ii, 660, 1858.

*Pisidium abditum*, Haldeman, Prime, Cat. Corb. 14, 1863.

Smith. Inst. Misc. Coll., Prime Monog. Corb. 68, f. 72, 73, 1865.

*U. S. of America.*

## 2. *P. Adamsi*, Prime.

*Cyclas nitida*, Mighles, Proc. Soc. N. H. Bost. i, 48, 1841.

J. N. H. Bost. iii, 330, pl. iii, f. 11, 1841.

*Pisidium Adamsi*, Prime, Stimp. Moll. N. E. 16, 1851. Bost.

J. vi, 352, pl. xi, f. 1—3, 1852.

*Sphaerium nitidum*, Deshayes, Brit. Mus. Cat. Conchif. 271, 1854.

*Pisidium Adamsi*, Prime, Cat. Corb. 13, 1863. Smith. Inst.

Misc. Coll., Prime Monog. Corb. 63, f. 63, 64, 1865.

*U. S. of America.*

## 3. *P. æquilaterale*, Prime.

J. N. H. Bost. vi. 366, pl. xii, f. 23—25, 1852. Prime,

Cat. Corb. 14, 1863. Smith. Misc. Col., Prime Monog.

Corb. 23, f. 65, 66, 1865.

*U. S. of America.*

## 4. *P. amnicum*, Jenyns.

*Tellina amnica*, Müller, Verm. ii, 205, 1774.



- Tellina striata*, Schröter, Fluss. Conch. 193, 1779.  
*Tellina rivalis*, Maton & Racket, Trans. Linn. Soc. Lond. iii, 44, pl. xiii, f. 37, 38, 1797.  
*Cyclas palustris*, Draparnaud, Drap. Tabl. Moll. 106, 1801.  
*Cardium amnicum*, Montagu, Test. Brit. 86, 1803.  
*Cyclas obliqua*, Lamarek, An. v, 559, 1818.  
*Pera fluviatilis*, Leach, in litt. in Mus. Brit. 1820.  
*Pera Henslowiana*, Leach, in litt. in Mus. Brit. 1820.  
*Pisidium obliquum*, C. Pfeiffer, System. Anord. 124, pl. v, f. 19, 20, 1821.  
*Cyclas amnica*, Turton, Conch. Brit. 250, pl. ii, f. xv, 1822.  
*Pisidium amnicum*, Jenyns, Trans. Phil. Soc. Cambr. iv, 309, pl. xix, f. 2, 1832.  
*Pisidium inflatum*, Megerle, Porro. Mal. Comasca, 121, pl. ii, f. 13, 1838.  
*Cyclas Pfeifferi*, Ziegler, Loc. sup. cit. 121, 1838.  
*Pisidium palustre*, Porro., Loc. sup. cit. 121, 1838.  
*Cordula amnica*, Leach, Moll. Brit. Synop. 291, 1852.  
*Pera amnica*, Leach, Loc. sup. cit. 292, 1852.  
*Pisidium Grateloupianum*, Normand. Cycl. Dépt. Nord, 4, 1854.  
*Pisidium intermedium*, Gassies, Act. Soc. Linn. Bord. xx, 1855.  
*Pisidium sulcatum*, Parreys in litt.  
*Pisum amnicum*, Deshayes, Brit. Mus. Cat. Conchif. 284, 1854.  
*Pisidium amnicum*, Jenyns, Baudon, Pisid. Fr. 37, pl. iii, J. G. H., 1857.  
*Pisidium Burgundiacum*, Billié in litt., 1858.  
*Musculium amnicum*, H. & A. Adams, Gen. Rec. Moll. ii, 451, 1858.  
*Pisidium amnicum*, Jenyns, Prime, Cat. Corb. 15, 1863.  
Europe.  
**5. P. Angelicum**, Rowell, Proc. Calif. Acad. Nat. Sciences.  
Angel Island, California.  
**6. P. Arcaeforme**, Malm.  
Sweden.  
**7. P. Australe**, Deshayes (non Philippi).  
*Cyclas Australis*, Lamarek, (varietas), An. v, 660, 1818.  
*Pisum Australe*, Deshayes, Brit. Mus. Cat. Conchif. 285, 1854.  
*Musculium Australe*, H. & A. Adams, Gen. Rec. Moll. ii, 451, 1858.  
King George's Sound, New Holland.  
**8. P. Canariense**, Shuttleworth, Mittheil. Naturf. Gesell. Bern. 1852.  
*Pisum Canariense*, Deshayes, Brit. Mus. Cat. Conchif. 281, 1854.



*Musculiam Canariense*; H. & A. Adams, Gen. Rec. Moll. ii, 451, 1858.

*Pisidium Canariense*, Shuttleworth, Prime, Cat. Corb. 17, 1863. *Canary Islands.*

**9. P. Casertanum**, Bourguignat.

*Cardium Casertanum*, Poli, Test. Sicil. i, 65, pl. xvi, f. 1, 1791.

*Cardium amnicum*, jr. Montagu, Test. Brit. 88, 1803.

*Cyelas vitrea*, Risso, Hist. Nat. Nice. iv, 338, 1826.

*Pera pulchella*, Leach, in litt. in Mus. Brit., 1820.

*Pisidium pulchellum*, Jenyns, Trans. Phil. Soc. Cambr. iv, 306, pl. xxi, f. 1—5, 1832.

*Pisidium Australe*, Philippi (non Deshayes), Enum. Moll. Sicil. i, 39, 1836.

*Pisidium cinereum*, Alder, Trans. N. H. Soc. Northumb. ii, 337, 1837.

*Pisidium Lumsternianum*, Forbes, Ann. N. H., 255, pl. xii, f. 4, 1839.

*Pisidium obtusale*, Villa, Cat. 44, 1841.

*Cyelas obliqua* (pars), Dupuy, Moll. Gers., 91, 1843.

*Cyelas pulchella*, Hanley, Descrip. Cat. 91, 1844.

*Cyelas cinerea*, Hanley, Loc. sup. cit. 91, 1844.

*Cyelas lenticularis*, Normand. Not. Cycl. Valenc. 8, f. 7, 8, 1844.

*Pisidium Joannis*, Macgillivray, Hist. Moll. An. 202, 252, 1843.

*Pisidium Jenynsii*, Macgillivray, Loc. sup. cit. 209, 249, 1843.

*Pisidium Australe*, Philippi (non Deshayes), Enum. Moll. Sicil. ii, 31, pl. xiv, f. 2, 1844.

*Pisidium vitreum*, Verany, Descrip. Genova, 1846.

*Pisidium limosum*, Gassies, Moll. Agen. 206, pl. ii, f. 10, 11, 1849.

*Pisidium iratianum*, Dupuy, Gall. Test. No. 234, 1849.

*Pisidium thermale*, Dupuy, Loc. sup. cit. No. 238, 1849.

*Pisidium caliculatum*, Dupuy, Loc. sup. cit. No. 229, 1849.

*Pisidium sinuatum*, Bourguignat, J. Conchyl. ii, 421, 1851.

*Pisidium lenticulare*, Dupuy, Hist. Moll. Fr. 680, pl. xxx, f. 2, 1852.

*Pisidium Casertanum*, Bourguignat, Rer. Mag. Zool. 1854.

*Pisum Casertanum*, Deshayes, Brit. Mus. Cat. Conchif. 275, 1854.

*Pisum vitreum*, pars Deshayes, Loc. sup. cit. 276, 1854.

*Pisum pulchellum*, Deshayes, Loc. sup. cit. 278, 1854.

*Pisum Lumsternianum*, Deshayes, Loc. sup. cit. 280, 1854.

*Pisum lenticulare*, Deshayes, Loc. sup. cit. 280, 1854.

*Pisum depressum*, Deshayes, Loc. sup. cit. 285, 1854.

*Pisidium rotundum*, de Cessac Bull. Soc. Sci. Nat. Creuse, ii, 1855.

*Pisidium globulosum*, Gassies, Act. Soc. Linn. Bord. xx, 1855.

*Pisidium planum*, Pfeiffer, in litt.

*Pisidium Casertanum*, Bourguignat, Baudon, Pisid. Fr. 30, pl. ii, f. C, 1857.

*Pisidium Stabileii*, Schmidt, in litt. 1858.

*Musculium Casertanum*, H. & A. Adams, Gen. Rec. Moll. ii, 451, 1858.

*Musculium vitreum*, H. & A. Adams, Loc. sup. cit. ii, 452, 1858.

*Sphærium Herminii*, Wäld, in Collect. Cuming, 1859.

*Pisidium Casertanum*, Bourguignat. Prime. Cat. Corb. 16, 1863. *Europe.*

# 10. *P. Chilense*, Deshayes.

*Cycas Chilensis*, D'Orbigny, Voy. 568, pl. 83, f. 11-13, 1846.

*Pera Chilensis*, Gray, Brit. Mus. List Shells. S. Amer. 69, 1854.

*Pisum Chilense*, Deshayes, Brit. Mus. Cat. Conchif. 254, 1854.

*Musculium Chilense*, H. & A. Adams, Gen. Rec. Moll. ii, 451, 1858.

*Corbicula Chilensis*, Prime, Proc. Ac. N. S. Phila. 269, 1860.

*Pisidium angulatum*, Prime, Proc. Zool. Lond. xxviii, 322, 1860.

*Pisidium Chilense*, Deshayes, Prime. Cat. Corb. 15, 1863. Smith. Inst. Misc. Coll., Prime Monog. Corb. 69, f. 75, 1865. *Chili, S. America.*

# 11. *P. compressum*, Prime.

*Cycas altilis*, Anthony, in litt, 1847.

*Pisidium compressum*, Prime, Proc. Soc. N. H. Bost. iv, 164, 1851.

*Pisidium altile*, Anthony, J. N. H. Bost. vi, 353, pl. xi, f. 10-12, 1852.

*Pisidium cicer*, Prime, Ann. Lyc. N. H. N. Y. vi, 65, pl. 1, f. 1, 1853.

*Pisum compressum*, Deshayes, Brit. Mus. Cat. Conchif. 282, 1854.

*Pisum altile*, Deshayes, Loc. sup. cit. 280, 1854.

*Musculium compressum*, H. & A. Adams, Gen. Rec. Moll. ii, 451, 1858.

*Musculium cicer*, H. & A. Adams, Loc. sup. cit. ii, 451, 1858.

*Pisum cicer*, H. & A. Adams, Loc. sup. cit. ii, 660, 1858.

*Pisidium compressum*, Prime, Cat. Corb. 14, 1863. Smith. Inst. Misc. Coll., Prime Monog. Corb. 64, f. 67, 68, 1865. *U. S. of America.*

12. **P. conicum**, Baudon.  
Baudon. Pisid. Fr. 50, fl. v, f. B, 1857. Prime. Cat. Corb.  
17, 1863. France.
13. **P. consanguineum**, Prime.  
Smith. Inst. Misc. Coll., Prime Monog. Corb. 76, f. 86,  
1865. Cuba, West Indies.
14. **P. cuneatum**, Bielz.  
Bielz. Moll. Siebenb. 1863. Transylvania.
15. **P. duplicatum**, C. Pfeiffer.  
*Cyclas duplicata*, C. Pfeiffer, System. Arnord. 230, 1821.  
*Musculium duplicatum*, H. & A. Adams, Gen. Rec. Moll. ii,  
451, 1858.  
*Pisum duplicatum*, H. & A. Adams, Loc. sup. cit. ii, 660,  
1858.  
*Pisidium duplicatum*, C. Pfeiffer, Prime Cat. Corb. 17,  
1863. Germany.
16. **P. Ferroense**, Mörch, Cat. Suenson, 43, 1857.  
Prime Cat. Corb. 17, 1863. Farroe Islands.
17. **P. ferrugineum**, Prime.  
Proc. Soc. N. H. Bost. iv, 162, 1851. J. N. H. Bost. vi,  
362, pl. xii, f. 8—10, 1852. Prime, Cat. Corb. 15, 1863.  
Smith. Inst. Misc. Coll., Prime Monog. 71, f. 77, 78,  
1865. U. S. of America.
18. **P. fuscum**, Parreys.  
Haydinger, Berichte vii, 211, 1851. Germany.
19. **P. Gassiesanum**, Dupuy.  
Gassies, Moll. Agen. 207, pl. ii, f. 11, 1849.  
*Pisidium Normandianum*, Dupuy, Loc. sup. cit. 206, 1848.  
*Pisidium tetragonum*, Normand, Cycl. Dépt. Nord. 5, 1854.  
*Pisum vitreum*, Deshayes (pars), Brit. Mus. Cat. Conchif. 277,  
1854.  
*Pisidium Baudonianum*, de Cessac, Bull. Soc. Sci. Nat.  
Creuse. ii, 1855.  
*Pisidium Gassiesianum*, Dupuy, Baudon Pisid. Fr. 26, pl. i,  
f. F, 1857. France.
20. **P. Gundlachi**, Arango. Cuba, West Indies.
21. **P. Harfordianum**, Prime. Mendocino Co., California.
22. **P. Henslowianum**, Jenyns.  
*Pera Henslowiana*, Leach, in litt. in Mus. Brit. 1820.  
*Cyclas acuta*, C. Pfeiffer, System. Arnord. 230, 1821.  
*Tellina Henslowana*, Sheppard, Trans. Linn. Soc. Lond. xiv,  
150, 1823.

- Cyclas appendiculata*, Turton, Man. 15, pl. i, f. 6, 1831.  
*Pisidium acutum*, C. Pfeiffer, Wieg. Archiv. i, 230, 1831.  
*Pisidium Henslowianum*, Jenyns, Trans. Phil. Soc. Cambr. iv, 308, pl. xxi, f. 6, 7, 1832.  
*Pera appendiculata*, Leach, Moll. Brit. Synop. 292, 1852.  
*Pisidium Jayanum*, Gassies, in litt. 1852.  
*Pisidium Dupuyanum*, Normand, Cycl. Dépt. Nord, 5, 1854.  
*Pisidium solitarium*, Gassies, in litt. 1855.  
*Pisidium pallidum*, Gassies, Act. Soc. Linn. Bord. xx, 1855.  
*Pisidium Bonnafoxianum*, de Cessac, Bull. Soc. Sci. Nat. Crense. ii, 1855.  
*Pisidium Jaudouinianum*, Gassies, Act. Soc. Linn. Bord. xx, 1855.  
*Pisidium pictum*, de Cessac in litt. 1855.  
*Pisum Henslowianum*, Deshayes, Brit. Mus. Cat. Conchif. 278, 1854.  
*Pisidium Henslowianum*, Jenyns, Baudon, Pisid. Fr. 45, pl. iv, f. F. 1857.  
*Musculium Henslowianum*, H. and A. Adams, Gen. Rec. Moll. ii, 451, 1858.  
*Pisidium Henslowianum*, Jenyns, Prime, Cat. Corb. 17, 1863. *Europe.*  
**23. P. insigne**, Gabb. Amer. J. Conch. 69, pl. f. ii, 2, pl. iv, f. 10, 1868. *Fort Tejon, California.*  
**24. P. Jamaicense**, Prime.  
*Cyclas pygmea*, C. B. Adams, Contr. Conch. 44, 1849.  
*Pisum Adamsi*, Deshayes, Brit. Mus. Cat. Conchif. 284, 1854.  
*Musculium pygmeum*, H. and A. Adams, Gen. Rec. Moll. ii, 452, 1858.  
*Pisum pygmeum*, H. and A. Adams, Loc. sup. cit. ii, 660, 1858.  
*Pisidium Jamaicense*, Prime, Cat. Corb. 15, 1863. Smith. Inst. Misc. Coll. Prime, Monog. Corb. 70, f. 76, 1865. *Jamaica, West Indies.*  
**25. P. Moietessieranum**, Paladilhe, Rev. Mag. Zool. 1866. *Marseilles, France.*  
**26. P. nitidum**, Jenyns.  
*Cyclas pusilla*, Turton, Conch. Brit. 16, pl. i, f. 7, 1831.  
*Pisidium nitidum*, Jenyns, Trans. Phil. Soc. Cambr. iv, 304, pl. xx, f. 7, 8, 1832.  
*Cyclas nitida*, Hanley, Descrip. Cat. 90, pl. xiv, f. 46, 1844.  
*Pisidium incertum*, Normand, Cycl. Dépt. Nord. 6, 1854.  
*Pisum nitidum*, Deshayes, Brit. Mus. Cat. Conchif. 277, 1854.

*Pisidium nitidum*, Jenyns, Baudon, Pisid. Fr. 23, pl. i, f. A. 1857.

*Musculium nitidum*, H. and A. Adams, Gen. Rec. Moll. ii, 451, 1858.

*Pisidium nitidum*, Jenyns, Prime, Cat. Corb. 17, 1863.

Europe.

**27. P. Nov.-Eboracense**, Prime, Ann. Lyc. N. H. N. Y. vi, 66, pl. i, f. 3, 1853.

*Pisidium amplum*, Ingalls in litt. 1855.

*Musculium Nov.-Eboracense*, H. and A. Adams, Gen. Rec. Moll. ii, 451, 1858.

*Pisum Nov.-Eboracense*, H. and A. Adams, Loc. sup. cit. ii, 660, 1858.

*Pisidium Nov.-Eboracense*, Prime, Cat. Corb. 14, 1863. Smith. Inst. Misc. Coll., Prime Monog. Corb. 67, f. 71. 1865.

U. S. of America.

**28. P. Nov.-Zelandicum**, Prime, Cat. Corb. 17, 1863. Ann. Lyc. N. H. N. Y. viii, 91, f. 39, 1864.

New Zealand.

**29. P. obtusale**, C. Pfeiffer.

*Cyclas obtusalis*, Lamarck, An. v, 559, 1818.

*Pera gibba*, Leach, in litt. in Mus. Brit. 1820.

*Cyclas minima*, Studer, Meissner. Anzeig. iii, 83, 1820.

*Pisidium obtusale*, C. Pfeiffer, System. Anord. 125, pl. v, f. 20, 21, 1821.

*Cyclas gibba*, Alder, Trans. N. H. Soc. Northumb. 1, 41, 1830.

*Pisidium obtusale*, Jenyns, Trans. Phil. Soc. Cambr. iv, 301, pl. xx, f. 1—3, 1832.

*Cyclas ovalis*, Nilsson, Trans. Phil. Soc. Cambr. iv, 1832.

*Pisidium mininum*, Studer, Nouv. Mém. Soc. Helv. Sc. Nat. 1, 25, 1837.

*Pisidium ovale*, Petit, J. Conchyl. ii, 421, 1851.

*Pisum obtusale*, Deshayes, Brit. Mus. Cat. Conchif. 279, 1854.

*Pisidium obtusale*, C. Pfeiffer, Baudon, Pisid. Fr. 18, pl. i, f. E, 1857.

*Musculium obtusale*, H. & A. Adams, Gen. Rec. Moll. ii, 452, 1858.

*Pisidium obtusale*, C. Pfeiffer, Prime, Cat. Corb. 17, 1863.

Europe.

**30. P. occidentale**, Newcomb. Proc. Ac. N. S. Calif. ii, 94, 1863. Smith. Inst. Misc. Coll., Prime Monog. Corb. 73, 1865.

San Francisco, California.

**31. P. parvulum**, Benson in litt.

Prime, Cat. Corb. 17, 1863.

India.



- 32. *P. personatum***, Malm. *Iceland and Sweden.*
- 33. *P. pulchellum***, Deshayes.  
*Cyclas pulchella*, D'Orbigny (non Hanley), Mag. Zool. 1835.  
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TO BE EXCLUDED.

- Pisidium abruptum*, Haldeman. = *P. Virginicum*.  
*Pisidium acutum*, Pfeiffer. = *P. Henslowianum*.  
*Pisum Adamsi*, Deshayes. = *P. Jamaicense*.  
*Physemoda equalis*, Rafinesque. = *P. Virginicum*.  
*Pisidium altile*, Anthony, = *P. compressum*.  
*Pisidium amplum*, Ingalls. = *P. Nov.-Eboracense*.

- Pisid. angulatum*, Prime. = *P. Chilense*.  
*Pera appendiculata*, Leach. = *P. Henslowianum*.  
*Pisidium arcuatum*, Prime. = *P. abditum*.  
*Pisid. Australe*, Philippi, (non Deshayes). = *P. Casertanum*.  
*Pisum Bahiense*, Deshayes. = *Sph. Bahiense*.  
*Pisidium Baudonianum*, de Cessac. = *P. Gassiesanum*.  
*Pisid. Bonnafouxianum*, de Cessac. = *P. Henslowianum*.  
*Pisid. caliculatum*, Dupuy. = *P. Casertanum*.  
*Pisid. cicer*, Prime. = *P. compressum*.  
*Pisid. cinereum*, Alder. = *P. Casertanum*.  
*Pisid. cornea*, Verany. = *Sph. corneum*.  
*Pisum Creplini*, Deshayes. = *Sph. Creplini*.  
*Pisid. Dingoli*, Bivona. = *Sph. Dingoli*.  
*Pisid. depressum*, Pfeiffer ; undescribed.  
*Pisid. dubium*, Haldeman. = *P. Virginicum*.  
*Pisid. Dupuyanum*, Normand. = *P. Henslowianum*.  
*Pisum edentulum*, Deshayes. = *Sph. striatinum*.  
*Pisum ferrugineum*, Deshayes. = *Sph. ferrugineum*.  
*Pera fluviatilis*, Leach. = *P. amnicum*.  
*Pisid. fontinale*, Pfeiffer. = *P. pusillum*.  
*Pera gibba*, Leach. = *P. obtusale*.  
*Pisid. globulosum*, Gassies. = *P. Casertanum*.  
*Pisid. grande*, Whittmore. = *P. variabile*.  
*Pisid. Grateloupianum*, Normand. = *P. amnicum*.  
*Pisid. incertum*, Normand. = *P. nitidum*.  
*Pisid. inflatum*, Megerle. = *P. amnicum*.  
*Pisid. intermedium*, Gassies. = *P. amnicum*.  
*Pisid. iratianum*, Dupuy. = *P. Casertanum*.  
*Pisid. Jaudonianum*, Gassies. = *P. Henslowianum*.  
*Pisid. Jenynsi*, Macgillivray. = *P. Casertanum*.  
*Pisid. Joannis*, Macgillivray, = *P. Casertanum*.  
*Pisid. Kurtzi*, Prime. = *P. abditum*.  
*Pisid. lenticulare*, Dupuy. = *P. Casertanum*.  
*Pisid. limosum*, Gassies. = *P. Casertanum*.  
*Pisid. Lumsternianum*, Forbes. = *P. Casertanum*.  
*Pisum maculatum*, Deshayes. = *Sph. Bahiense*.  
*Pisid. minimum*, Studer. = *P. obtusale*.  
*Pisid. minus*, Stimpson. = *P. abditum*.  
*Pisum modioliforme*, Deshayes. = *Sph. modioliforme*.  
*Pisid. Moquinianum*, Bourguignat. = *Sph. modioliforme*.  
*Pisid. Normandianum*, Dupuy. = *P. Gassiesanum*.  
*Pisid. notatum*, Prime. = *P. abditum*.  
*Pisid. obliquum*, Pfeiffer. = *P. amnicum*.  
*Pisid. obscurum*, Prime. = *P. abditum*.  
*Pisid. ovale*, Petit. = *P. obtusale*.

- Pisid. pallidum*, Gassies. = *P. Henslowianum*.  
*Pisid. palustre*, Porro. = *P. amnicum*.  
*Pisid. palustre*, Lewis. = *P. variabile*.  
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*Pisid. rotundum*, de Cessac. = *P. Casertanum*.  
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*Pisum Veatleyi*, Deshayes. = *Sph. Veatleyi*.  
*Pisid. vitreum*, Verany. = *P. Casertanum*.  
*Pisid. zonatum*, Prime. = *P. abditum*.

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ERRATUM.—Under synonymy of genus *Sphærium*, page 150, place "*Euglesa*, Leach, in litt. in Mus. Brit. 1818—20."

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*Meeting Oct. 7th, 1869.*

Eight members present.

DR. RUSCHENBERGER, Director, in the Chair.

Numerous donations to the Museum and Library were announced.

The following papers were presented for publication in the Journal, and referred to Committees :

“On the Pterocerae of Lamarek and their mutual relations ;” by Theodore Gill, M.D.

“Materials for a Monograph of the Family Lepetidae ;” by Wm. H. Dall.

“On the Land and Fresh-water Mollusca of Nicaragua ;” by Ralph Tate.

“Descriptions of New Species of Marine Mollusca ;” by Wesley Newcomb, M.D.

“Description of a new American Helix ;” by Wesley Newcomb, M.D.

“Catalogue of the Shells of the Coosa River, Alabama ;” by James Lewis, M.D.

"Descriptions of new species of Marine Bivalve Mollusca in the collection of the Academy of Natural Sciences of Philadelphia;" by Geo. W. Tryon, Jr.

"Notices and Reviews of New Conchological Works;" by Geo. W. Tryon, Jr.

The following was offered for separate publication :

"Monograph of the Fresh-water Univalve Mollusca of the United States; Parts 1 and 2 (in continuation of Prof. Halde-  
man's work);" by Geo. W. Tryon, Jr.

Mr. Tryon read the following letter addressed to him for the purpose of publication in the Journal :

*Dear Sir :*

On the 6th of June last I found a number of living specimens of what I believed to be the *Helicina occulta* of Say. Doubting my own judgment, I submitted some of them to Messrs. W. G. Binney and T. Bland. Those gentlemen have confirmed my opinion, and say : "We are both confident about its identity,—thus settling satisfactorily a long mooted point."

The precise locality where they occur is a fishing station, known as Whitefish Bay, about five miles north of this city, upon the bluff of the lake, which, at that point, is somewhat wet and boggy, and covered with a growth of Tamarack, Arbor-Vitæ, and Juniper. They were found under dead leaves in considerable quantities, yet could hardly be said to be abundant.

Very respectfully,

E. R. LELAND.

*Milwaukee, Wis., July 19, 1869.*

Mr. Tryon remarked that until recently this species was believed to be extinct; but a year or more since, recent specimens were forwarded to the Section from Lexington, Virginia, where they were collected by Prof. McDonald, of the Virginia Military Institute. Prof. McD. reported the shell to be abundant in this locality.

Mr. John Ford exhibited specimens of a *Gemma gemma*, Totten, remarkable for having fallen during a storm which occurred at Chester, Pa., on the afternoon of June 6th, 1869.

These specimens were apparently adult, though very minute; measuring one-eighth of an inch in length, by three-sixteenths of an inch in breadth.

Mr. F. stated that he had made inquiry of several gentlemen who had witnessed the storm on the occasion referred to, and that the answers of each of them had so corroborated those of the others as to leave no doubt in his mind as to their having fallen in immense numbers.



Though the most of them were in a broken condition, large numbers of perfect ones were collected in various places sheltered from the heavy rain which followed their descent.

One of the gentlemen referred to,—Y. S. Walter, Esq., editor of the *Delaware County Republican*, published at Chester,—assured Mr. F. that he noticed the singular character of the storm at its very commencement, “and,” to use his own words, “it appeared like a storm within a storm; a very fine rain falling rapidly, veiled by the shells, which fell slower and with a whirling motion.”

Judging from the remains of animal matter attached to some of the specimens, together with the fresh appearance of the epidermis, it is highly probable that many of them were living at the moment of transition.

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## ON THE PTEROCERÆ OF LAMARCK, AND THEIR MUTUAL RELATIONS.

BY THEODORE GILL, M. D.

From the earliest times of scientific zoology, there has been almost universally recognized as a natural group,\* and with its proper affinities as since demonstrated, that group of living Strombidæ provided with a digitated expanded lip, with which the Lamarckian name of *Pterocera* has been most generally associated. Whether the mutual relations of the components of that group have been equally well appreciated will be the subject for present inquiry.

### § 1. DIFFERENTIAL CHARACTERS.

#### 1. *Primary spines and their homologies.*

Accepting the current views, ten recent species of *Pterocera*, as defined by Lamarck, are distinguishable, and these differ in the number of alar digitations, the direction of the digitations, their distribution, and their relative size, the form of the aperture, as well as the presence or absence of rugosities on the lip, and other trivial characters.

As to the number of digitations, the difference would at first appear to be very great, but more extended study demonstrates that it is more apparent than real, and that, in the case of species with an enlarged number of digitations, a distinction should be made between primary and secondary or intercalary ones.

Eliminating for the present such secondary or intercalary digitations, the species of the group are distributable into two minor groups; one distinguished by the major development of six primary digitations, (exclusive of the canal), and the other by

\* To it, however, have been referred species which are not closely related to the species of the natural group, and which have only an analogical resemblance to such.

the presence of only five ; tracing those digitations to their origin, it is further found that a still more important distinction prevails, and that they are very differently grouped and developed from entirely different elements.

In the one group, that embracing the largest number of species,—those having six digitations, and of which *P. lumbis* is a representative,—the distribution is as follows :

1st. Just below the suture is a fasciole, (*sutural*), but little differentiated, which finally trends upwards on the spire, and terminates in a single digitation accumbent on the spire, and continued more or less upwards from its apex. 2d. Between the suture and angle, in the mature shell, a fasciole becomes developed which emits a spine (*post angular*) directed backwards. 3d. Around the angle of the cone is a fasciole (*angular*) generally indistinct, but becoming well developed a short distance from the lip in the adult, and terminating in a digitation. 4th. Below or in advance, another fasciole (*pre-angular*) girds the whorl, and also terminates in a digitation ; the distinction between the third and fourth is generally slight, and the angular tubercles covering both in common, they may perhaps be considered as forming a compound fasciole. 5th. Another fasciole (*medial*) girds the whorl around the middle and likewise terminates in a digitation. 6th. Still another (*post-sinual*) emits a spine behind the sinus ; an ante-sinual fasciole is unarmed ; as is also a lobal. The canal terminates in a long tortuous digitation curved towards the right. Finally, reference must not be omitted to an auriform lobe with which the posterior digitation is sometimes furnished towards the left.

In the second group, represented by *P. chiragra*, a very different distribution prevails. 1st. The *sutural* fasciole is represented by two diverging branches, one of which (*sutural*) continuing its quasi-sutural course, terminates in a spine which at base crosses the spire, and is curved towards the left and upwards, and the other (*sub-sutural*) terminates in a spine pointed backwards ; 2d, the *angular* fasciole is undivided, and terminates in a single spine, curved outwards and backwards ; 3d, the *medial* fasciole is also simple, and terminates in a single recurved spine ; 4th, the *postsinual* fasciole is simple, and *edigitate* ; 5th, the ante-sinual fasciole is well developed, and the lobal terminates in a large recurved spine ; the siphonal canal is cornuform and recurved towards the left.

As to the homologies between the digitations of the species of this group and those of the preceding, there can be no doubt, after due study.

The large posterior digitation recurved to the left represents

the sutural one of *P. lambis*, *P. pseudoscorpio*, *P. elongata*, *P. violacea*, etc.

The angular digitation is homologous with the (median) angular of *P. lambis*, &c.

The lobal digitation has no developed homologue in front of the inflected lobe of *P. lambis* or its associates, although the fasciole may be distinctly developed.

Of course, no doubt can exist as to the homologies of the siphoniferous canal, however much the lobal digitation of the one and the anterior one of the other may correspond in apparent position or curvature, and the difference in direction of the siphonal canal, and its simple trend towards the left in *P. chiragra* is therefore to be regarded in some manner as the reflection of the development of the post-lobal digitation and formative element in that type.

The relations and differences between the armature of the two groups thus distinguished, may be expressed in a concise manner by the following formula :

<i>P. lambis</i> , &c.	<i>Spines.</i>	<i>P. chiragra</i> , &c.
1	Sutural.	1
0	Subsutural.	1
1	Postangular.	0
1	Angular.	1
1	Preangular.	0
1	Medial.	1
1	Postsinual.	0
0	Lobal.	1
Inclined towards right, 1	Siphonal.	1, curved toward left.

## 2. Secondary spines.

While in most of the Lamarekian *Pteroceras*, the primary spines enumerated are the only ones developed, in one of the groups there are species which possess, in addition, smaller spines interposed between, and more rarely, such intercalary

\* Pathology, which has furnished such aid to Physiology and Anatomy, may be invoked with advantage in Conchology. A malformed specimen of *P. lambis* exhibits a peculiar arrangement of the sutural digitations and perhaps furnishes a hint as to the possible manner of divergence of the two types so distinct at the present day. The last whorl, at its commencement, is rapidly deflected and thence regularly continued much below the suture, but trends upward as usual towards the matured lip; instead of a single digitation concurrent with the spire, there is a primary malformed one, which trends backwards like the subsutural of *P. chiragra*, and another diverging from and crossing the spire towards the left, as the sutural in *P. chiragra*. An excessive deposit of callus has obliterated the canals at the base.

spines are nearly as large as the primary ones. In order to appreciate the value of this character, it will be advisable to pass all the species in review.

1st. *P. lambis* and its nearly related congeners, *P. crocata*, and *P. bryonia*, have a perfectly entire lip between the primary digitations.\* (Digitations S. 1, A. 1+1+1. M. 1. P. 1.)=6.

2d. *P. scorpio* and *P. pseudoscorpio* are provided with small dentiform processes, caused by the expansion of the larger revolving striæ at their ends.

In *P. pseudoscorpio* there are two, one between the pre-angular and medial spines, and another between the medial and post-sinual. Digitations (S. 1. A. 1+1+1. (r). M 1. (r). P. 1.)=6+2 r.

In *P. scorpius*, however, not only do the corresponding striæ and those on each side thus terminate, but those diverging and running out on the sides of the digitations expand and are abruptly truncated, thus producing the nodose appearance of the digitations of that species so characteristic of it. Digitations (S. 1. (r) A. 1 (r) 1 (r) 1. (rx). M. 1. (rx). P. 1.)=6+rx.†

3d. *P. millipeda*, *P. elongata*, and *P. violacea* exhibit, at the margin of the lip, in place of dentiform processes like those of *P. scorpius*, more or less developed and channelled digitations, and the fascioles corresponding to them are generally developed and almost as well defined as the primary ones. In *P. millipeda*, however, they are sometimes no more defined than in *P. lambis*.

In *P. elongata* three angular spines are alone developed, (at least generally,) as in *P. lambis* and *P. scorpio* and their allies. Digitations (S. 1. A. 1+1+1. (I.) M. 1. (I.) P. 1.)=8.

In *P. millipeda* an intercalary digitation is interposed between the sutural and post-angular.‡ Digitations (S. 1. (I.) A. 1+1+1. (I.) M. 1. (I.) P. 1.)=9.

\* Reference is had only to the margin behind the sinus in all cases.

† In this connection it may be remarked that a specimen of *P. scorpius*, in the collection of the Smithsonian Institution, exhibits intercalary spines like *P. millipeda*; one between the lower angular and median, and another between the latter and postsinual; the lip had been broken after having commenced to send forth its spines; the primary spines are thrown farther out from the lip, and the median one is *smaller* than the secondaries. The characteristic œdematous condition of the spines has not been developed, and the specimen was referred by Dr. P. P. Carpenter to "*P. pseudoscorpio*," but the left basal lobe of the posterior spine, the elevated white ridge below the hollow of the dorsal tubercle, and the armed lip (features characteristic of *S. scorpius*, but hitherto unnoticed) unequivocally point out the true relations.

‡ The supernumerary digitation is sometimes undeveloped, as in *P. elongata*; there is, it may be added, no connection between such atrophy and that of the intercalary fascioles.

In *P. violacea* there are three angular (including post- and pre-angular) digitations as in *P. millipeda*, and instead of one median fasciole there are two. Digitations (S. 1. A. 1+1+1. (I.) P. M. 1. (I.) (A. M. 1 (I). P. 1.)=10.

### 3. Aperture.

Two quite different forms of aperture are recognizable in the Lamarckian genus. In *P. lambis*, &c., the aperture is linear, about equally wide from front to rear, and almost coequal in length with the whorl, and the cavity of a large tubercle which generally exists in the angular fasciole is open to view; a transverse fold is, however, on the columella behind and combines with a similar one generally developed on the opposite lip, behind or in front of the cavity, to form a constriction between the aperture proper and a canal emptying into the posterior or marginal digitation. All the species resembling *P. lambis* in the number and distribution of the primary spines agree likewise in the form of aperture.

*P. chiragra* and *P. rugosa* have an unguiform or claw-shaped aperture, but little curved, and the region of the angular tubercle and cavity is concealed by the contraction of the aperture, produced by longitudinal plication of the columella and a corresponding development of the labral surface.

### 4. Character of lip surface.

The species of the group exhibit much difference in the character of the surface of the lips, some having a very smooth and polished callous surface, while in others the surface is much wrinkled and folded. They may be considered in order of development.

1st. In *P. lambis* *P. byronia* and *P. crocata*, the lips are covered with a perfectly smooth callous coat.

2d. In *P. chiragra* the margins of the aperture are delicately wrinkled, the wrinkles being white.

3d. In *P. violacea* the surface of the outer lip is delicately wrinkled, while the rugæ of the inner are still fainter.

4th. In *P. millipeda* the wrinkles are about equally developed on the surface of both lips, but they are comparatively little raised.

5th. In *P. scorpio*, *P. pseudoscorpio* and *P. elongata* as well as *P. rugosa*, the wrinkles are very prominent, and pearly white, strongly contrasting with the pearly intervals.

## § 2. TAXONOMIC DEDUCTIONS.

Having thus examined the modifications of the principal differential characters which distinguish the species of *Pterocera*,



it remains to apply the information gained to the combination of the several forms.

1st. In the number, position and direction of the primary spines, and in the form of the aperture, there is a close and essential similarity between *P. lambis*, *P. bryonia*, *P. crocata*, *P. scorpius*, *P. pseudoscorpio*, *P. millipeda*, *P. violacea* and *P. elongata*.

2d. On the other hand, in all such respects, *P. chiragra* and *P. rugosa* differ very much from the others and equally closely agree with each other.

As to the intercalary spines, the extreme species of the first of such groups differ widely, but are connected by a series of species exhibiting intermediate character.

As to lip surface, there is likewise a considerable difference between the extreme species of the same group, but between such are interposed the species *P. violacea* and *P. millipeda*.

In the second group the two species exhibit almost equally great difference in the character of the lip surface, although in other respects so closely allied.

It will be apparent that there is no coincidence between the development of the wrinkled lip surface and of the intercalary spines, unless indeed it be admitted that the dentiform labral lobes of *P. scorpius* and *P. pseudoscorpio* are spines. Such an admission would, however, be a virtual confession of the insignificant value of the development of the intercalary spines. On the other hand, the comparison of *P. violacea* with *P. millipeda* and of *P. chiragra* with *P. rugosa*, attest to the slight value of the presence or absence of the rugosities as distinctive of natural groups.

Full consideration would therefore appear to necessitate the combination of *P. lambis* and those already enumerated as associates in one natural group, and of *P. chiragra* and *P. rugosa*, in another, and in accordance with the prevalent valuation of groups, such would seem to be well entitled to generic rank. What names such genera should bear must be a subject for special investigation, and a review of the literary history is requisite.

### § 3. HISTORY.

The founder of the binomial nomenclature associated all the species known to him, as well as representatives of the genus *Aporrhais* and of *Rostellaria* in the genus *Strombus*, in a section (the first or "Digitati"), characterized by the digitated lip. The genus was first subdivided by a binomial systematist, in 1797,—Humphrey, in the "*Museum calonnianum*," published in that year, combining together the species of the section Digitati of Linné, and reserving for it the name *Strombus*, while for those with a simple lip he proposed the name *Alatus*, but neither

name was accompanied with a diagnosis or remarks of any kind, and their extent are only determinable by their contents and the synonymy given of the included species.

Lamarck subsequently (in 1799) subdivided the same Linnæan genus, reserving the name *Strombus* for the species with a simple alated lip, and bestowing that of *Pterocera* on those characterized by a digitated labrum, (excepting, however, the *S. pespelecani* and *S. fusus*) each genus being circumscribed and defined by an appropriate diagnosis and reference to specific types. The *Strombus lambis* of Linné was named as the type of *Pterocera*. The genera thus limited were, as is well known, very generally accepted by succeeding naturalists, and without modification for a long period.

In 1851, however, Dr. O. Mörch, in the catalogue of the Yoldi collection, while retaining the name *Pterocera* in the Lamarckian sense, subdivided the group, but without accompanying diagnoses, or limitation by any remarks, into three subgenera, for which he adopted the Kleinian names *Harpago*, *Millipes* and *Heptadactylus*; he included in the first the "*chiragra*," and "*arthritica*," as well as "*pseudoscorpio*;" in the second "*millipeda*" and "*scorpius*;" and in the last "*lambis*" and its near associates. The association of "*pseudoscorpio*" with "*chiragra*" and "*rugosa*," was perhaps inadvertent, the result of a printer's error or a lapsus calami. The brothers Adams, with the amendments so required, accepted the three subgenera, and at the same time supplanted the name *Pterocera* by *Harpago*, as that of the including genus. The "genus" was defined so as to include all the species; the "sub-genus *Millipes*, Klein," was characterized by the "outer and inner lips corrugated, digitations of outer lip numerous," and the "sub-genus *Heptadactylus*, Klein," by the "outer and inner lips smooth; digitations not numerous;" the typical sub-genus was not defined, and would therefore receive the residuum,\* covered by the generic diagnosis, and eliminated by the diagnoses of the other sub-genera—a course conducive to economy of time and thought, but of doubtful expediency.

A still different association of species has lately been proposed by Mr. Gabb (American Journal of Conchology, iv, 139), who has also adopted the Lamarckian genus in its integrity, and with the same limitation by diagnosis as Lamarck had provided, but he has subdivided it into two subgenera, *Pterocera* and the "sub-genus *Millipes*, H. & A. Adams," distinguishing the latter by the "margins of aperture transversely wrinkled and corru-

\* Such a residuum would include a large number of extinct forms, some of which have been actually referred to the genus by Chenu.

gated," and leaving the residuum eliminated by such diagnosis in the remaining and otherwise not restricted sub-genus.

It is also necessary to recall that Klein had, as early as 1753, proposed for species of this group the pseudogeneric names *Radix-bryoniæ*, *Harpago*, *Heptadactylus* and *Millipes*.

"*Radix bryoniæ*" formed "genus xii" of his "classis ii, (*Voluta longa*)," and the others, respectively, genera ii, iii and iv of his "classis iv, (*Alata*)" of his "sectio ii, *Cochlis composita*,"—the latter being one of two groups into which Klein divided the univalve shells, and whose only common character was (applicable to a limited extent only), based on the obconic or cylindroid form of the large body whorl, and the comparatively small spire,\* which conveyed to Klein the idea of two spiral shells having a common base. His class "*Voluta longa*" was based on the obconic or oblong form capped by a little prominent spire,† and his "*Alata*," accepted from Rumphius, on the alation of the outer lip, and the sinus with which that lip is furnished towards the front.‡ The characters of these groups not being comparable or contrasted, it is not to be wondered at that a man like Klein should have referred the same form to two classes [*i. e.* families] especially if that form possessed the characters of each. And in truth Klein's genera *Radix bryoniæ* and *Heptadactylus* are based on the same form, but then they really have the characters of the classes in which they are respectively placed! *Radix bryoniæ* has the obconic form (and so does *Heptadactylus*) of the *Voluta longa*, and *Heptadactylus* has the alate and sinuated lip of the *Alata* (but which likewise *Radix bryoniæ* possesses)! Klein's failure to perceive the relations in this case may be supposed to have resulted from the immature condition of *Radix bryoniæ*, the digitations being little developed;§ *Harpago* was distinguished by its six spines, of which one, the largest, followed the direction of the spire, and two, one on each side of the first,

\* Klein's diagnosis was as follows: "*Cochlides compositas* dicimus, in quibus duplex testæ circumvolutio, ita ut quasi ex duabus cochlidibus videatur composita." P. 59.

† "*Cochlides vultæ* dicuntur *longæ*, quæ, præter ventris oblongi gyros internos, alios ex basi producunt externos." P. 64.

‡ "*Alutas* dicimus, cum *Rumphio*, cochlides compositas, quæ labium insigniter expandunt, & ad anteriorem canaliculum sinum excisum habent. Si labium in murices abit, dicuntur speciali nomine: *Cornuta*." p. 97.

The class *Alata* corresponds to the *Alata* or *Strombideæ* of modern naturalists, after the exclusion of the *Rostellarie*, and Klein's acceptance of so natural an assemblage does not permit one, as so often tempted, to utterly deny him any judgment or power of appreciation and valuation of characters.

§ "Genus xii. *Radix bryoniæ*. § 211. Huic radici assimilamus *volutam* conicam in decurrente mucrone radiatam." p. 79.

were curved towards each other like the horns of a cow.\* *Heptadactylus* was distinguished by the development of seven spines,† and *Millipes* of ten or eleven.‡ The genus *Harpago* would be equivalent, so far as the diagnosis and known species are concerned, to the natural group of which *P. chiragra* and *P. rugosa* are the representatives. *Heptadactylus* includes the species *P. lambis* (Kleinian species 1, 2, 3, 4 and 5,) and *P. scorpio* or *P. pseudoscorpio* (K. s. 6,) as well as one of the *chiragra* group (K. s. 7,) to which, it is almost needless to say, the diagnosis is not applicable; finally, *Millipes* includes two nominal species identifiable with *P. millipeda*.

The Kleinian names *Harpago*, *Heptadactylus*, and *Millipes*, were adopted for groups, as already indicated, by Mörch and the Adams brothers, but with modified limits, so far as the species enumerated were concerned; at the sacrifice, however, in the case of the Adams, of conformity between the characters of the species and the diagnosis.

The facts that Montfort, in 1810, applied the modified name *Pteroceres* to the Lamarekian genus, and that in 1822 Fabricius gave the new name *Digitata*, are only of historic interest.

#### § 4. REVIEW.

The rules of the British and American associations for the advancement of science are provisionally, at least, adopted.

Under one of those rules, the pseudogeneric names connected with species of this group by Aldrovandi, Klein and others will be at once eliminated from consideration as ante-Linnæan and not binomial.

Under another rule, Humphrey's limitation of the genus *Strombus* to the present forms cannot be accepted, as neither the genus itself nor those eliminated from it were in any manner characterized.§

\* "Genus ii. Harpago. § 252. Ab uncis dicitur *Trocho-Conus*, labiosus, torosus, tympanosus, in sex murices acutos & aduncos fissus. Ultimus ad mucronem longissimus; duo sequentes & sibi oppositi sunt recurvi, instar cornu bovinum; reliqui tres breviores, valde adunci. Testa ab extra alba; maculis fuscis picta. Pentadactylus, *Plinii*." p. 98.

† "Genus iii. Heptadactylus, § 254. Est. *Trocho-Conus*, labio in septem murices diviso." p. 99. ‡ "Genus iv. Millipes. § 256. Est *Trocho-Conus* labiosus & cornutus; ex labio 10. vel 11. murices curvos protendens; super dorso nodoso lineis rufis & nigris pictus." p. 99.

§ This rule is here adopted, as on another occasion, under protest. It is doubtless the duty of an author to state the reasons for such changes from an accepted method as he may deem advisable, and neglect to characterize such genera or other groups to which he first applies names, at least gratuitously transfers the labor of interpreting his own thoughts on another, and, it may be, is too much like obtaining credit on false pre-



Lamarck's name *Pterocera* having been the first one proposed that was binomial and accompanied by a diagnosis, must therefore be adopted; and as it was especially typified by *P. lambis*, it must be retained for the group represented by that species.

Having repeated the diagnoses of the several subdivisions of *Pterocera* proposed by authors, it will be apparent that none have been hitherto based on more than the number of spines and the absence or presence of labial rugosities. It may further be remarked that previous authors have equally failed in their specific descriptions or otherwise to recognize any other than numerical differences, or those of form in the digitations.

With respect to the subdivisions of the Lamarckian genus, Mörch, first of the moderns who subdivided it, gave no diagnoses, and, if he should be judged by his distribution of the species, it would be difficult to surmise his views; but, as already remarked, his chief error was probably typographical or inadvertent.

The diagnoses of the Adams brothers are not consistent with the contents of the genera, two of the five species of *Millipes* (*pseudo-scorpio* and *scorpio*) not having the "digitations of outer lip numerous," but "not numerous," as in *Heptadactylus*, from which they differ, however, by having the "outer and inner lips corrugated." The typical species of *Harpago* have the outer and inner lips corrugated, and digitations not numerous; consequent-

tences. But would not the *spirit* of the rule cited require that the diagnosis should also, besides being *correct* in its original application, be even strictly applicable to the groups with which the name should afterwards be associated? Little consideration would be sufficient to show what confusion would be the result of such interpretation, however. In the group under review, for example, the Linnæan diagnosis of *Strombus* is inapplicable to any group to which an author would now apply the name; *Pterocera*, as characterized by Lamarck, is quite different from that now characterized, and still more apposite are the Adamsian diagnoses of *Harpago*, *Millipes*, and *Pterocera*. The diagnoses of those groups (in one case by implication) are by no means characteristic of their contents. The diagnoses are simply transmutations in combination of two characters; that of *Millipes* really excludes two of the five species referred to, and those two would be relegated to *Harpago*! In this case the authors were more happy in their appreciation than in their verbal limitation. The question naturally recurs then, is a diagnosis that is actually erroneous, and that misleads better than none at all? But if we reply in the negative, and yet accept the rule, how many rejections of accepted names, and what countless changes would the logical application of such a rule entail! The rule, however, has the merit of conveying the sense of naturalists generally, that one has no right to shirk a duty, even should he fail, and that if his time be insufficient, or his power of expression be not adequate to those of appreciation, silence should be his course, unless he can make arrangement with another *willing* to assume the labor he is unable to perform. He, or a recognised representative should, at least, with a new name, reveal the knowledge of which it may be supposed to be the expression,—or perhaps, the ignorance.

ly, so far as the characters given would indicate, the species do not differ subgenerically from those forms of *Heptadactylus*. As it might be replied that the dentiform lobes between the digitations were also considered as digitations, it is not superfluous to add that the species of *Harpago* have similar dentiform lobes. The Adamsian groups are indeed natural, but in spite of their diagnoses. The value of those groups is by no means equal, however. It is quite true that there may be great inequality in the value of natural genera, and that some naturalists would recognize genera in the *Pterocera* of the *lambis* form on the one hand, and those of the *scorpio* and *millipeda* on the other, or, indeed, in each form. This would be a simple question of appreciation of values; the present writer is indisposed to regard the differences as of generic importance.

Mr. Gabb's combination of the rugose *Pterocera* with the species of *Harpago* in a single genus contradistinguished from the *Pterocera* with smooth lips, it must be confessed, was not a happy modification, as that able naturalist, on reconsideration, would doubtless admit.

In pursuance of the views explained, the Lamarckian *Pterocera* will therefore be re-distributed among two genera, on the bases already indicated and as set forth in the following diagnoses.

The differences in the dentition of the radula between the genera are immaterial, but so are those between the *Pterocera* and the *Strombi*, as defined; it is possible that the apparent differences between the two may be still further reduced or altogether nullified by the examination of other species.

## § 5. DESCRIPTIVE.

### PTEROCERA, Lamarck.

#### *Historical Synonymy.*

*Aporrhais*, sp. Aldrovandi, De Test. pp. 343, 344.

*Radix bryoniae*, sp. Klein, Tent. Meth. Ostrac. 1753, p. 79.

*Heptadactylus*, sp. Klein, op. cit. p. 99.

*Millipes*, sp. Klein. op. cit. p. 99.

#### *Binomial Synonymy.*

< *Strombus*, Humphrey, Mus. Calonn. 1798, p. 39. (Not limited by description.)

< *Pterocera*, Lam., Prod. 1799, p. 72; Syst. An. sans Vert. 1801, p. 80. (*P. lambis*.)

< *Pteroceres*, Montf., Conch. Syst. ii, 1810, p. 606. (*P. scorpio*)

< *Digitata*, Fabr., Fort. 1822, p. 86.

> *Pterocera* (*Millipes*), Mörch, Cat. Yoldi, i, 1852, p. 60. (Not described.)



- > *Pterocera* (*Heptadactylus*), Mörch, op. cit. p. 60. (Not described.)
- > *Harpago* (*Millipes*),\* H. and A. Adams, Gen. Moll. i, 1858, p. 261.
- > *Harpago* (*Heptadactylus*),\* H. and A. Adams, op. cit. p. 261.
- < *Pterocera* (*Pterocera*), Gabb, Am. Jour. Conch. iv, 1868, p. 139.
- Strombus*, sp. Linn. et al.
- Lambis*, sp. Bolten.
- Pterocera* (*Millipes*), sp. Gabb.

*Animal* stromboid; radula (*S. lambis*, *bryonia*) with the *rhachidian* teeth two and a half to three times as wide as long, somewhat narrowed towards base, with a large convex median tooth, and two or three smaller on each side; inner plate oblong rhomboidal, with a heel developed on the inner part of the basal border, and a process near the base and from the external edge; cutting margin with a large inner pointed tooth and three or four smaller ones; *lateral plates* very long, narrow and curved, armed on the anterior margin near the point with from three to six teeth; outer lateral plate broader at base than inner. (Troschel.)†

*Shell* obconoid, with the spire moderately elevated, the canal produced into a long involute digitation, tortuous and inclined towards the right, the labrum much alated and produced into spiniform digitations, and with the sinus deep and entirely lateral.‡ *Whorls* concave between the angle and the suture, coarsely spirally striated, and with six§ more or less developed primary fascioles, emitting as many involute primary digitations, of which the sutural or posterior is accumbent on the spire and continued backwards from the apex, three radiate from and near the angle, and two are between the latter and the sinus; secondary fascioles and spines are, in some species, interposed between the primary; antesinual lobe unarmed. *Aperture* linear, continued to the posterior boundary of the whorl.

\* The Messrs. Adams called these subgenera, but they always employ their subgenera in a generic sense.

† Dr. Troschel refers to a figure of *P. lambis*, but the one cited represents *Aporrhais*, under which reference is again made to the same figure.

‡ The "entirely lateral" sinus contrasts with the anterior position characteristic of the genus *Euprotomus* (*St. auris-dianæ*, etc.), in which the expansion of the lip and deflection of the anterior portion of the shell and revolving striæ throw it entirely forwards.

§ The exceptional number of seven is developed in *P. violacea*.

## SPECIES.

Eight distinctly marked species are distinguishable among the forms that have been described or indicated. These may be naturally grouped with reference to the development of certain characters. Of primary importance seems to be the condition of labial surface, some being smooth and others rugose at that region; those having rugose lips differ again in the development of the processes between the primary labral spines, such processes being generally simple lobes in some species, while in others they are extended into involute spines. The general form, ornamentation, development of the lip, and especially of the spines, in their respective variations furnish other excellent characters for the discrimination of the species. As several important differences seem to have hitherto been generally overlooked, the following synopsis and amended but incomplete diagnoses of the species may be acceptable:

*Synopsis.*

## I. Lips smooth.

Ia. Body whorl tuberculated at the angle.

Lip effected; columella with callus diffused, *P. lambis*.

Lip inflected; columella with callus stratified, *P. crocata*.

Ib. Body whorl unarmed at angle, *P. bryonia*.

## II. Lips rugose.

IIa. Intercalary digitations none.

Posterior digitation with a basal lobe, *P. scorpius*.

Posterior digitation simple, *P. pseudoscorpio*.

IIb. Intercalary digitations developed.

Posterior digitation simple, *P. millipeda*.

Posterior digitation with a basal lobe.

Labral digitations 8; labral wrinkles very distinct, *P. elongata*.

Labral digitations 10; labral wrinkles faint, *P. violacea*.

A. Aperture smooth within. Primary digitations of labrum only developed; six, or exceptionally seven in number.\*

1. *P. LAMBIS*, Lam. ex Linn.

*Strombus lambis*, Linn., Syst. Nat. ed. 12, p. 1208.

*Pterocère scorpion*, Blainv., Malac. pl. 25, f. 3, 4. (not Lam.)

\* In a specimen of *P. bryonia* in the collection of the Smithsonian Institution, there are four angular spines, the lower of which is forked, as in an example mentioned by Humphrey.

*Pterocera lambis*, Lam., Prod. p. 72; Hist. Nat. An. sans Vert. ed. 2, ix, 672. Reeve, Mon. Pterocera, sp. 8.

*Pterocera (Heptadactylus) lambis*, Mörch, Cat. Yoldi, p. 60.

*Heptadactylus lambis*, Ad. f. Gen. Moll. i, p. 261.

*Harpago lambis*, Ad. f. Gen. Moll. Atlas, pl. 27, f. 2.

Angular fasciole carinated on spire, on the last whorl provided with two enlarged tubercles; labium with the callus diffused; labrum with the margin (normally) everted, with the spines everted outward and rather small, and with the ante-sinual lobe undulated. Lips whitish, more or less sanguineous within and behind.

*Hab.*—Philippine Islands and Ceylon.

2. *P. CROCATA*, Link.\*

*Pterocera crocata*, Link, Verz. Nat. Samml. Rostock?

*Pterocera aurantia*, Lam., Hist. Nat. An. sans Vert. ed. 2, ix, 675. Reeve, Mon. Pterocera, sp. 7.

*Pterocera (Heptadactylus) crocata*, Mörch, Cat. Yoldi, i, p. 60.

*Heptadactylus crocatus*, Ad. f. Gen. Moll. i, p. 261.

Angular fasciole carinated on spire, and on the last whorl armed with two enlarged tubercles; labium with the callus concentrated, and stratified or folded near aperture; labrum with its margin inflected, the digitations successively more recurved, and the antesignal lobe tridentate. Lips more or less orange or saffron-colored.

*Hab.*—Philippine Islands.

3. *P. BRYONIA*, Reeve ex Gmel.

*Strombus radix bryonia*, Chem., Conch. Cab. x, p. 227, pl. 159, f. 1512-15.

*Strombus bryonia*, Gmel. in Linn. Syst. Nat. ed. 13, p. 3520.

*Strombus truncatus*, Dillw., Cat. ii, p. 659.

*Pterocera truncata*, Lam., Hist. Nat. An. sans Vert. ed. 2, ix, p. 671. Kiener, Spec. Gen. Pterocère, p. 3, pls. 1 and 10.

*Pterocera bryonia*, Reeve, Mon. Pterocera, sp. 1.

*Pterocera Sebæ*, Kiener (ex Val.), Spec. Gen. Pterocère, p. 4, pl. 2, and pl. 4, f. 2.

*Pterocera radix bryoniæ*, Mörch, Cat. Yoldi, p. 60.

*Heptadactylus radix-bryoniæ*, Ad. f. Gen. Moll. i, p. 261.

Young. *Pyrula bengalina*, Grat., 1840.

Angle coronated or tuberculigerous on spire, *unarmed*

\* This name is accepted on authority of Mörch and Adams.

on the last whorl; labium with the callus diffused; labrum with its margin erect, with six moderate digitations, and with the antesinual lobe little undulated. Lips whitish or lurid.

*Hab.*—Society Islands.

B. Aperture corrugated within. (*Millipes*, Mörch, Ad. f.)

1. Digitations of labrum six, between the median of which are dentiform processes.

4. *P. SCORPIUS*, Lam. ex Linn.

*Strombus scorpius*, Linn., Syst. Nat. ed. 12, p. 1208.

*Pterocera nodosa*, Encycl., pl. 410, f. 2. Swains., Exotic Conch. App. p. 32.

*Pterocera scorpio*, Lam., Hist. Nat. An. sans Vert. ed. 2, ix, p. 674.

*Pterocera scorpius*, Reeve, Mon. Pterocera, sp. 3.

*Pterocera (Millipes) scorpio*, Mörch, Cat. Yoldi, p. 60.

*Millipes scorpio*, Ad. f. Gen. Moll. i, p. 261.

*Pterocera (Millipes) scorpio*, Gabb, Am. Journ. Conch. iv, p. 140.

Labrum with a prominent transverse white ridge in front of the concavity of the dorsal tubercle; laterally inflected, ribbed between the spines, and with a dentated margin; the spines nodose, and the posterior furnished with a compressed auriform lobe at the left base.

*Hab.*—Philippine Islands.

5. *P. PSEUDOSCORPIO*, Lam.

*Pterocera pseudo-scorpio*, Lam., Hist. Nat. An. sans Vert. ed. 2, ix, p. 674. Reeve, Mon. Pterocera, sp. 4.

*Pterocera (Harpago) pseudoscorpio*, Mörch, Cat. Yoldi, p. 60.

*Millipes pseudoscorpio*, Ad. f. Gen. Moll. i, p. 261.

Labrum with no distinct ridge behind, and with the concavity of the tubercle mostly in advance of the columellar fold; moderately inflected, with single dentiform lobes between the angular and median, and median and postsinual spines; with spines obsoletely or not at all nodose, and the posterior simple and with no basal lobe.

*Hab.*—Zanzibar, etc.

This very distinct species has hitherto only been distinguished from *P. scorpius* by the larger size and larger and less nodose spines, and consequently it was natural that Reeve and others should have been of the opinion that "it is extremely doubtful

whether this is anything more than a local variety of the foregoing species." Kiener, acting on this opinion, united it with *P. scorpio*, adding that the only difference he could perceive were the slight superiority in size, and the thicker and less nodulose digitations.

2. Digitations of labrum separated by secondary ones intercalated at the right margin.

The validity of three species of this section is now no longer questioned, but it must be confessed that, however readily they may be recognized, some of their most distinctive characters have not been alluded to in the diagnoses published. Without repeating characters generally given, they may be additionally distinguished as follows :

6. *P. MILLIPEDA*, Lam. ex Linn.

- Strombus millipeda*, Linn., Syst. Nat. ed. 12. p. 1208.  
*Pterocera millipeda*, Lam., Hist. Nat. An. sans Vert. ed. 2, ix, p. 673; Reeve, Mon. Pterocera, sp. 10.  
*Pterocera (Millipes) millipeda*, Mörch, Cat. Yoldi, p. 60.  
*Millipes millipeda*, Adams, f. Gen. Moll. i, p. 261.

Angle armed with four digitations, the uppermost (rarely null) being an intercalated one; posterior digitation simple; lateral digitations, especially the primary, much recurved; lips with wrinkles moderately developed.

*Hab.*—Philippine Islands.

7. *P. ELONGATA*, Swains.

- Strombus novem-dactylis instructus*, Chem., Conch. Cab. x, p. 207, pl. 155, f. 1479, 1480.  
*Strombus millipeda*, var. B., Dillw., Cat. ii, p. 660.  
*Pterocera millipeda*, part Lam., Hist. Nat. An. sans Vert. ed. 2, ix, p. 673 (Syn. part; *not desc.*)  
*Pterocera elongata*, Swains., Exotic Conch., App. p. 32.  
 Reeve, Mon. Pterocera, sp. 9.  
*Pterocera crocea*, Sowb., Thes. Conch. p. 11, f. 4.  
*Millipes elongatus*, Ad. f. Gen. Moll. i, p. 261.

Angle armed with the three normal digitations; posterior digitation furnished with a lobe at its left base; lateral digitations straight; lips with wrinkles well developed.

*Hab.*—?

## 8. P. VIOLACEA, Swains.

*Strombus multipes*, Chem., Conch. Cab. x, p. 216, pl. 157, f. 1494-5 (not binomial author).

*Pterocera millipeda*, part Lam., Hist. Nat. An. sans Vert. ed. 2, ix, p. 673 (Syn. part; not desc.)

*Pteroceca violacea*, Swains., Exotic Conch., App. p. 33.

*Pterocera multipes*, Desh., in Lam. Hist. Nat. An. sans Vert. ed. 2, ix, p. 677. Reeve, Mon. Pterocera, sp. 5.

*Millipes multipes*, Ad. f. Gen. Moll. i, p. 261.

Angle armed with three digitations; a posterior and an anterior median fasciole in place of the normal single fasciole; posterior digitation with an elongated lobe at its left base; lateral digitations straight or little curved; all the digitations are channelled and not involute; wrinkles on the labium anteriorly faint or obsolete.

*Hab.*—East Coast of Africa, fide Reeve.

HARPAGO, H. and A. Adams ex Klein.

*Synonymy.*

=*Harpago*, Klein, Tent. Meth. Ostrac. 1753, p. 79 (not binomial).

=*Pterocera* (*Harpago*), Mörch, Cat. Yoldi, i, 1852, p. 60 (not described).

=*Harpago*, H. and A. Ad., Gen. Moll. i, 1858, p. 60.

>*Harpago*, Gabb, Am. Journ. Conch. iv, 1868, p. 140.

*Strombus*, sp. Linn., Humphrey, &c.

*Lambis*, sp. Bolten.

*Pterocera*, sp. Lam., &c.

*Animal* stromboid; radula (*H. chiragra*) with the rhachidian teeth transversely oblong, about twice as wide as long, and contracted towards the base, with a large median and two smaller teeth on each side; inner plates oblong-rhomboidal or trapezoidal, with a continuous, but sinuous hinder margin, with very large inner tooth, followed by three smaller ones and a cutting ledge; lateral plates very long, narrow and curved, armed with about five teeth on the anterior margin near the tips. (Troschel.)

*Shell* obconoid, with the spire moderately elevated, the canal produced into a long involute digitation boldly recurved towards the left, with a sinus at its base; the labrum much alated and produced into spiniform digitations, and with the sinus deep and entirely lateral. *Whorls* concave between the angle and suture, coarsely spirally striated, and with fascioles (except sutural) well developed, the subsutural emitting a spine not accumbent on the



spire, directed backwards, and the sutural a second accumbent on and crossing the spire, and recurved towards the left and backwards; angular and median emitting single recurved spines; postsinual unarmed; lobal emitting a large recurved spine in advance of the middle of the ante-sinual lobe.

*Aperture* unguiform, contracted behind by the development of longitudinal callous ridges, which are almost applied on each other, the columellar being outermost.

The two species may be briefly distinguished as follows:

1. *HARPAGO CHIRAGRA*, Adams f. ex Linn.

*Strombus chiragra*, Linn., Syst. Nat. ed. 12, p. 1207.

*Pterocera chiragra*, Lam., Hist. Nat. An. sans Vert. ed. 2, ix, p. 675. Reeve, Mon. Pterocera, sp. 2.

*Pterocera (Harpago) chiragra*, Mörch, Cat. Yoldi, i, p. 60.

*Harpago chiragra*, Ad. f. Gen. Moll. i, p. 261.

Fascioles, angular tuberculated, others almost unarmed, ante-sinual with a compressed tubercle near the base of the digitation; lips rosaceous, with very faint and almost obsolete wrinkles; sutural digitation with a canal open at base, the outer border being bent outwards and attached above the angle of the body whorl, on which the digitation is chiefly bent and accumbent. Large.

*Hab.*—Society Islands.

2. *HARPAGO RUGOSA*, ex Sowerby.

*Pterocera chiragra*, part Lam., Hist. Nat. An. sans Vert. ed. 2, ix, p. 675 (Syn. part; not desc.)

*Pterocera rugosa*, Sowb., Thes. Conch. part 2, pl. 11, f. 9, 10. Reeve, Mon. Pterocera, sp. 6.

*Pterocera (Harpago) arthritica*, Mörch, Cat. Yoldi, p. 60.

*Harpago arthriticus*, Ad. f. Gen. Moll. i, p. 261.

Fascioles, except sutural and ante-sinual, with prominent tubercles; ante-sinual smooth; lips with very prominent white wrinkles, contrasted strongly with the deep purplish or blackish ground; basal posterior digitation with its canal closed by the reflection of its margins, and accumbent on the middle of the spire. Size moderate.

*Hab.*—Eastern seas.

§ 6. EXTINCT ASSOCIATES.

To the genus *Pterocera* have been referred numerous species by various authors, most of which, however, have been success-

ively eliminated therefrom by others, and have served as constituents of new genera, or been associated with previously established ones. The propriety of the elimination of the forms which have been referred to the genera *Aporrhais* and its dismemberments, *Alaria*, *Diarthema*, *Pterocerella*, *Dicroloma*, and *Tessarolax*, may be at once admitted. With equal propriety has Mr. Gabb eliminated *P. speciosa*, *P. Dupiniana*, and *P. marginata*, all described by d'Orbigny, from the residuum, but the propriety of combining those three together in one subgenus, to be considered as of *Pterocera*, is questionable, especially as the typical species is not provided "with a straight or recurved canal anteriorly, and a canal ascending the spire posteriorly;" or an "outer lip digitate;" its relations, indeed, appear to be rather with the typical Strombidæ.

After all these eliminations, as Mr. Gabb has remarked, "in the cretaceous and jurassic formations are many shells with all the characters called for in the commonly received definition of *Pterocera*, but having a peculiar 'facies' of their own," yet from which, "except in general appearance [he] can find no difference," and thus, by the latest reviser of the group, they are left in *Pterocera*. This residuum, however, contains no species to which the amended diagnoses of *Pterocera* and *Harpago* are applicable, and it is by no means certain that any are at all related to those genera. There are, however, two types which have at least considerable superficial resemblance to them, and which may possibly belong to the Strombidæ, but such appears to the writer improbable, and provisionally, at least, they may be more advantageously retained among the *Aporrhaidæ*. They do not appear to have the sinus characteristic of the *Strombidæ*; in one, indeed (*Pt. Moreausiana*, d'Orb.), a sinus might be considered to exist, on faith of the illustration, but the appearance is rather produced, there is reason to believe, by the extension of the anterior fasciole into an aborted lobe or digitation, and a consequent emargination between it and the median digitation. In order to secure for the forms in question due attention and re-examination, it seems advisable to especially designate them, but I have not had the opportunity of examining them, and derive my information respecting them solely from d'Orbigny's "Paléontologie Francaise."

#### HARPAGODES, Gill.

*Pterocera*, sp. d'Orb., etc.

Shell obconic or ovate-conoid, with the spire moderately elevated, the canal produced into a long digitation boldly recurved towards the left, and the labrum m

spiniform digitations. Whorls convex or flat between the angle and suture, spirally ribbed, with larger rib-like angular, median, and anterior fascioles (and sometimes post-angular), each emitting long spiniform digitations; and with a sutural canaliculate digitation accumbent on the spire, continued and recurved backwards. Cretaceous and Jurassic.

Type H. PELAGI.

*Pterocera Pelagi*, d'Orb., Pal. Franc., T. cret. ii, pl. 212.

#### CERATOSIPHON, Gill.

Shell fusi-conic, with the spire considerably elevated, the canal produced into a long digitation recurved towards the left, and the labrum much alated and produced into spiniform digitations. Whorls concave or flat between the angle and suture, spirally striated, and with rib-like angular, median, and anterior fascioles, of which the two former, at least, emit spiniform digitations, the sutural emitting a digitiform canal accumbent on the spire and directed backwards.

Type C. MOREAUSIANA.

*Pterocera Moreausiana*, d'Orb., Pal. Franc., T. cret. ii, pl. 211, f. 1.

Distinguished by the elongated hamiform siphonal canal and the posterior canal co-ordinated with the "facies" of *Aporrhais*.

#### § 7. APPENDIX.

As the useful "Manuel de Conchyliologie" of Dr. Chenu is the guide of many conchologists, the species figured therein may be here identified with propriety, especially as some of the species have been misunderstood. Fig. 1612 represents *H. rugosa*, not "*P. chiragra*"; 1613, "*P. lombis*" correctly; 1614, "*P. multipes*" = *P. violacea* correctly; 1615, *P. pseudoscorpio*, not "*P. scorpio*"; 1616, *P. violacea*, not "*P. millipeda*"; 1617, "*P. elongatus*" = *P. elongata* correctly.

# MATERIALS FOR A MONOGRAPH OF THE FAMILY LEPETIDÆ.

BY WM. H. DALL.

I have to thank Dr. Stimpson, of the Chicago Academy of Sciences, for the use of material, and am much indebted to the Smithsonian Institution for the use of the specimens in their cabinet, for the purposes of comparison.

Any contribution to science, tending to clear up the uncertainty which hangs over many shells, supposed to be circumbo-real, or otherwise, is not without value, and perhaps for this family in particular, which has been more or less misunderstood and confused by every author who has mentioned it, principally from the habit of copying from one author to another, without original verification.

## Family *LEPETIDÆ*.

*Syn. Lepetidæ*, Gray, Guide, p. 172.

*Patellea*, \*\*\* Lovén, p. 199.

*Patellidæ*, (pars), Auct.

*Tecturidæ*, (pars), Jeffreys, Adams.

*Characters*.—Branchiæ none. Eyes none. Rostrum provided with labial tentacles. Dental formula  $\frac{1}{\frac{1}{2} \frac{1}{2}}$ . Rhachidian tooth rhomboidal, cuspidate. Laterals slender, cuspidate. Shell patelliform.

Genus *LEPETA*, Gray, P. Z. S. 1847, p. 168.

*Syn. Patella* (pars), auct.

*Cryptobranchia* (pars), Midd., Sib. Reise, p. 183, 1851.  
Schrenck, R. v. Amurl. p. 291, 1867.

*Propilidium*, Gray, Guide Moll. p. 172. H. and A. Ad.,  
Gen. R. Moll. p. 462. (Not Forbes and Hanley.)

*Pilidium*, Stimps., Shells of N. E. (Not Forbes and  
Hanley, nor Middendorf.)

*Scutellina*, Chenu, Manual, p. 375 (pars).

## Subgenus LEPETA, Dall ex Gray.

*Gen. ch.*—Apex erect; shell slightly colored, or uncolored, sculpture more or less strongly striate, reticulate or papillose. Mantle edge entire, simple. Tentacles setaceous. Rhachidian tooth tricuspid, central cusp much larger than the other two; shape rhomboidal. Laterals broadly simply cuspidate, pointed at their bases.

*Type.* LEPETA CÆCA, Gray. Plate 15, fig. 1, a, b, c, d.

*Syn.* ?? *Patella cæca*, O. F. Muller, Pr. Z. Danica 1766, p. 237; Zool. Dan. vol. i, p. 25.

*Patella cæca*, Lovén, Ov. K. v. Ak. For. p. 199, pl. vi, 1847.

?? *Patella cæca*, var. *genuina*, Midd., Bull. Phys. Math. Ac. Sci. St. Petersb. vol. vi, No. 20, 1847; Sib. Reise, p. 183, pl. xvi, fig. 6.

?? *Lepeta cæca*, Gray, P. Z. S. 1847, p. 168; Guide Moll. p. 172, fig. 103. H. and A. Adams, Gen. Rec. Moll. vol. i, p. 462 (not fig.) Jeffries, Brit. Conch. vol. iii, p. 251, pl. 5, fig. 6.

*Patella cerea*, Möller, Moll. Grönl. p. 16.

*Patella candida*, Couthouy, Bost. Jour. Nat. History, vol. ii, p. 86, pl. iii, fig. 17, Feb. 1838. Gould, Inv. Mass. p. 152, 1841.

*Pilidium candidum*, Stimpson, Shells of New England, p. 29, 1851.

? *Lepeta Franklini*,\* Gray, Guide Moll. p. 172.

Not *Propilidium ancylode* of Forbes and Hanley, as affirm Gray, Guide Moll. p. 172, and H. and A. Adams, Gen. Rec. Moll. vol. i, p. 462.

*Sp. ch.*—Shell patelliform. Apex erect, situated in the central third. Nucleus sinistral, deciduous. Sculpture fine radiating elevated striæ, rendered nodulous by the intersection of imbricated concentric lines of growth, forming a beautifully reticulated series of papillæ, stronger toward the base. Anterior and posterior planes sometimes arched, often straight, and very frequently somewhat concave, giving a peculiar prominence to the apex, which is generally eroded. Color white, generally concealed by a brown epidermis, and sometimes having a pinkish or rufous tinge. Shape somewhat elongate oval. Long. .45, lat. .34, alt. .22 in. Defl. 100°. Number examined, 38 specimens.

\* In none of the works at hand on the Mollusca can I find any other reference to this (?described) species than the original one of Dr. Gray. I therefore place it doubtfully in the synonymy of this species.

Soft parts. Body whitish, foot oval, thin, mantle entire, edge thickened. Rostrum with two tentacular appendages; anus opening over the neck, also ? genital duct. No eyes; tentacles setaceous, short, thick; no external gills. Rhachidian tooth tricuspid; central cusp long, pointed, black; lateral cusps centrally indented, giving the aspect of two denticles, on each side of the central cusp. Shape rounded rhomboidal; base delicately impressed with longitudinal lines, thickened. Outer laterals alated posteriorly, shafts pointed at the base. Inner laterals similar, not alate; cusps moderately broad, simple. Jaw simple, edge entire, divided into two parts by an impressed median line. Number examined, 20 specimens.

A shell resembling this was described by Müller in 1766, as having the apex inclined posteriorly, and his statement has been referred to this species, and copied by all subsequent authors. On a careful inspection of many authentic specimens, some of which still preserved the nuclear whorl, I am unable to find any grounds for the statement. The apex is in almost every case erect; in a very few strongly inclined forward. In none does it exhibit any tendency backward. It is true Müller's specimen may have been abnormal, but more probably he had in view a specimen of *Propilidium*, in which the apex is reversed, but which belongs to another family, although it has by Adams, Gray, and others, since been confounded with our shell. Stimpson, and later, Jeffreys, very properly separated them, though, pending the examination of the dentition, the precise position of *Propilidium* is doubtful. It has, however, distinct gills on the back of the neck, which, as well as the apical septum, exclude it from the Lepetidæ.

Loven's figure of the dentition of this species is correct in general effect, but incorrect in detail. This was doubtless due to the imperfection of his microscope, or other similar circumstances. The figure represents the ribbon obtained from a dried specimen from Norway, through Prof. Sars; now in the Smithsonian collection.

Specimens from Norway, Finmark, Greenland, Nova Scotia (*L. candida*, Couth.), Gaspé, and Grand Menan, have been examined, and no essential differences observed.

Middendorff reports it from the Ochotsk, and Schrenck, copying him, from North Japan seas, but they probably refer to varieties of the succeeding species, the shells having much general resemblance; though the anatomy of the animals shows them to be generically distinct.

Dr. Gray gives a copy of Müller's original figure from the Zool. Danica which shows no labial appendages, which strength-



ens the probability that he referred to *Propilidium* (Forbes and Hanl.), which is figured by them also without them; and their figure has been copied by Adams and others as *Lepeta cæca*. But these appendages are present, and even conspicuous, in specimens from Grand Menan in the Smithsonian Cabinet, and also were perceptible in Prof. Sar's dry specimen, from which the ribbon was obtained; they are also present in the two species of *Cryptobranchia* from the Pacific and Behring Strait. Hence it is hardly probable that they could have been overlooked.

Subgenus CRYPTOBRANCHIA, Dall ex Midd.

*Syn.* *Cryptobranchia*, Midd. (pars), Sib. Reise, p. 183. Idem, Schrenck (pars), Reise von Amurl. Moll. p. 291.  
*Lepeta*, Carpenter, Suppl. Rep. pp. 603 and 651 (not Gray).

*Diag.* Apex incl. anteriorly; shell slightly or not colored, striated. Rhachidian tooth provided with three nearly equal denticles. Uncini broadly hooked.

*Type.* CRYPTOBRANCHIA CONCENTRICA, Dall ex Midd. Plate 15, fig. 2, a to g.

*Syn.* *Patella* (*Cryptobr.*) *cæca*, var. ( $\beta$ ) *concentrica*, Midd., Sib. Reise, p. 183, pl. xvi, fig. 6. Sept., 1851.

*Patella cæca*, Idem, Bulletin Phys. Math. Acad. St. Petersburg, Vol. vi, No. 20, 1847. Schrenck, R. v. Amurl. Moll. p. 291, 1867.

*Lepeta cæcoides*? n. s., Cpr., Suppl. Rep. Br. Ass. pp. 603 and 651, 1863.

*Lepeta cæcoides*, J. G. Cooper, List. Cala. Moll. p. 24, No. 459. Carpenter, Proc. Ac. Nat. Sci. Phila. April, 1865, p. 60.

*Sp. ch.*—Shell patelliform, of a light brownish or greenish hue, even when weathered. Apex anteriorly directed,—conspicuously so in young individuals; situated in the anterior fourth. Anterior and posterior planes of the shell somewhat arcuate. Surface smooth, with delicate uniform elevated striæ radiating from the apex, like threads upon the surface of the shell; slightly, if at all, interrupted by the concentric lines of growth, which last, in some individuals, are strongly impressed at intervals, but otherwise hardly evident. The number of these impressed lines seldom exceeds three or four. Epidermis extremely thin, brownish, generally lost except in very young specimens. Interior smooth, polished, white, often with a greenish tinge. Palléal line complete. Muscular impression narrow, only interrupted

above the head. Length of adult specimen .84 in., breadth .64 in., altitude .26 in. Defl. of apex  $110^{\circ}$ , of ant. slope,  $54^{\circ}$ .

Length of most elevated specimen .56, breadth .45, alt. .26 in. Shell broadest posteriorly, making the outline somewhat of an egg-oval shape. Number examined, 107 specimens.

Soft parts. Foot oval, thin. Head broad, rostrum short, above rounded; below, produced on each side into a tentacular filament, somewhat longer and slenderer than the tentacles. Eyes absent; tentacles short, thick, with concentric wrinkles setaceous on either side of the rostrum. Mantle edge simple, thickened, slightly striate on the inner side, continuous in front of the head. Over the head extremely thin, varicose. Behind the head on right side are two papillæ, being the openings of the generative duct or ovary, and to the left of it, of the anus. Liver and ovary (which fills the apex) of a dark green, completely encircled by the intestine, which is of a dark brown color. Buccal mass large. Jaw thin, translucent, divided by an impressed median line into two portions; edge entire, simple.

Rhachidian tooth broadly cordate, bearing three nearly equal black cusps with orange bases. Base thickened ornate, like an ancient lyre with five strings. Inner lateral simple, cusp not much wider than the shaft. Outer lateral posteriorly alate, simple, strong. Base pointed. Shaft wider than the inner lateral, and as wide as the cusp. (See fig. 2, a.) Number examined, 13. Cabinets Smiths. Inst., McGill College, Chic. Ac. Sci., Bost. Soc. Nat. History.

This shell differs from the *Lepeta cæca* of Europe and Eastern America in its sculpture, so that, even without a knowledge of the animal, the conservative but accurate Middendorf separated it as a permanent variety, under the name *concentrica*. A more thorough knowledge reveals differences in the anatomy which the simplicity of the shells would not lead us to suspect, rendering a subgeneric separation necessary. Middendorf, ignorant of the genus *Lepeta*, which had not been characterized, but only indicated by Dr. Gray, proposed the genus *Cryptobranchia* for its reception, which, restricted as above, is here adopted. This species is the *L. cæcoides* of Dr. Carpenter.

Middendorf's specimens came from the Ochotsk Sea; Dr. Carpenter's from California and Puget Sound. I have it from St. George's Island, Behring Sea; Ounalashka, Ounga Id., 4 fms., Kadiak 6 fms., and 10 fms. shelly mud, Sitka harbor, on stones and dead shells. Also Monterey, which is probably its most southern station.

Very young specimens of ? *Scurria mitra*, Esch., might be

mistaken for this shell, but are more elevated, and the apex is erect and nearly central.

The absence of a gill is a remarkable feature in this family. The most careful dissection revealed none internally, nor is there ingress for water, except through the ovarian duct, anus, or mouth. The edge of the mantle is thick and slightly striate, and if this does not perform the office of a gill, possibly it may be done by the *hood*, or portion of the mantle immediately over the head and neck. There is quite a large extent of this thin varicose membrane, and it is possible that this may be its office. (Fig. 3, d.)

CRYPTOBRANCHIA ALBA, Dall, n. s. Plate 15, fig. 3, a, b, c, d.

*Sp. ch.*—Shell pure white, smooth, or with extremely faint striæ: solid; interior pure white, apex anteriorly directed, inconspicuous; shell arcuate before and behind. Length of adult .96, width .70, alt. .40 in. Number examined, 15 specimens.

Soft parts as in the last species, but tentacles much smaller, and also the labial tentacles. Rhachidian tooth with longer cusps proportionately than *concentrica*, somewhat rhomboidal; base lightly ornate; anterior corners produced, rounded; laterals with shafts simple, sinuous, cusps three times (or more) as broad as the shafts, barely denticulate along the edge, and finely striate beneath. Bases of shafts pointed. Number examined, 7 specimens. Seniavine Strait, Stimpson. Plover Bay, E. Siberia, Dall.

This species differs from the last in its smooth shell, greater size, pure whiteness, greater lateral compression, and generally more rounded back, from the less prominent apex. The tentacula in a specimen twice the size of a *concentrica* were not half as large. The teeth especially differ in the shape of the central tooth, and the greatly broader cusps of the laterals and their striation, resembling those of *Pilidium fulvum* (Lovén). These striæ are what Lovén terms “*cilia*,” which misapprehension probably arose from a poor microscope, as those instruments in 1847 were very far from their present perfection.

Cabs. Smithsonian Inst., Bost. Soc. Nat. Hist.

? CRYPTOBRANCHIA INSTABILIS, Dall, nom. prov. Plate 15, fig. 6.

*Sp. ch.*—Shell patelliform, depressed, broad, smooth or lightly striate (young). Apex inconspicuous, in the anterior fourth. Sculpture in the adult only of the concentric lines of growth, which are occasionally impressed. Plane of the base of the shell curved upward anteriorly and posteriorly, without compression of

the sides. Shell very thick, solid, muscular impression deeply impressed. Long. .56, lat. .52, alt. .20 in. Defl. apex  $120^{\circ}$ . Number examined, 6 specimens.

Soft parts unknown. Sitka, 10 fms. shelly mud, dead.

In the absence of the animal it is impossible to refer this singular form definitely. Its affinities appear to be with *Cryptobranchia*, as far as can be judged, except that the sides are compressed; it resembles a little *Nacella instabilis*, a much larger and more elevated shell, from California.

#### SPURIOUS SPECIES.

?? *Lepeta puntarenensis*, Trosch. (ex Mörch), Wiegman. Arch. 1860.

Syn. *Lepeta puntarenæ*! Mörch, Mollusk-fauna Centr. Am. Malak. Blät. Dec. 1860, p. 175, No. 215.

*Sp. ch.*—"Testa ovalis, apice elevata excentrica, intus lactea, extus flavescens; lineis exilibus, radiatibus et concentricis subæqualibus, creberrimis; confertim decussata intersectionibus nodosis. Margine integro. Facies *L. cæca*, Mulleri. Long. 6, lat. 4, alt. 2 mill. Punta Arenas (Pacific coast Central Amer.) 1 specimen. Differs from *L. cæca* in the very thick and strong concentric lines and delicate radiating lines."

This shell is probably not a *Lepeta*, its habitat being tropical; it may be a *Scutellina*, or even an *Acmæa*; it is quite impossible to determine the generic affinities from the shell alone.

#### Genus PILIDIUM Forbes.

Syn. *Pilidium (fulvum)*, Forbes, Athenæum, Oct. 6, 1849, p. 1018. Forbes and Hanley, Br. Moll. vol. ii, p. 440, 1849. Wood, Ind. Test. pl. 38, fig. 83.

*Iothia*, Gray (not Forbes), Syst. An. figs.; Moll. An. 1854, p. 93; Guide Moll. p. 172. H. and A. Adams, Gen. Rec. Moll. (Fam. Tecturidæ), vol. i, p. 461.

*Pilidium*, Stimpson, Check List E. C. Shells.

*Scutellina*, Chenu (pars), Man. de Conchy.

Not *Pilidium*, Midd. (*P. commodum*), Sib. Reise, 1851, p. 214 = ? *Velutina*, sp. jun., nor

*Pilidium*, Stimpson, Shells of N. Eng. = *Lepeta*, pars, nor

*Iothia*, Forbes = err. typ. for *Lottia*.

(The circumstances under which this genus was named having been a subject of discussion, and few naturalists in this country having the opportunity of consulting the newspaper report in which it was originally published, the extract is given *verbatim*.)

*Report of Meeting of the British Association for the Advancement of Science. London Athenæum, Oct. 6, 1849, p. 1018.*

“Section D. Natural History.

“Papers presented. ‘On the Genera of British Patellacea, by Prof. E. Forbes.’

“In the course of the researches undertaken by the author and Mr. Hanley for their joint work on the History of the British Mollusca, a fresh inquiry was required to be made into the propriety with which the British *Patellacea* had been assigned to known genera. It resulted that among our species we had two new forms for which it became necessary to construct new generic types,—viz.: the so-called *Iothia* [misprint for *Lottia*] *fulva*, and *Iothia* [do.] *ancyloides*. Neither of these belong to *Aemæa*, with which *Iothia* [do.] is synonymous, but differs essentially in characters of head, mantle and dentition,—and in the latter case, position of body in relation to the shell. As no established genus can receive them, for the former a new genus, *Pilidium*, is proposed, \* \* \* and for the latter, a new genus, *Propilidium*.”

The words enclosed in brackets are ours. Admitting the validity of a misprint, which is doubtful, the grounds for referring the first species to any other generic name than *Pilidium* are not apparent; and especially as Prof. Forbes says “*it differs essentially*” from the “*so-called Iothia*,” the reference of it to that generic name afterwards by several authors seems entirely gratuitous.\*

*Gen. ch.*—Shell patelliform. Apex anterior, generally deep colored. Mantle fringed with cilia. Rhachidian tooth long, rhomboidal, bearing a very large black cusp, with a simple denticle on each side. Laterals with broad cusps, striated beneath and obliquely bent. Shafts slender. (Lovèn.)

*Type.* *PILIDIUM FULVUM*, Forbes. Plate 15, fig. 4, 4a.

*Syn.* *Patella fulva*, O. F. Muller, Prod. Zool. Dan. p. 227; Zool. Dan. pl. 24, figs. 1, 2, 3. Lovèn, Ov. K. v. Ak. For. p. 199, pl. 6.

*Pilidium fulvum*, Forbes, Athenæum, Oct. 6th, 1849, p. 1018. Forbes and Hanley, Hist. Brit. Moll. vol. ii, p. 441, pl. 62, figs. 6, 7, pl. AA, fig. 3.

*Patella Forbesii*, J. Smith, M. Wern. Soc. vol. viii, p. 107, pl. ii, fig. 3. Brown, Ill. Con. Gt. Brit. pl. 57, figs. 3, 4.

\* See Woodward's Manual Recent and Fossil Shells, p. ii.



*Tectura (Iothia) fulva*, H. and A. Adams, Gen. Rec. Moll. vol. i, p. 461, pl. lii, fig. 6.

*Tectura fulva*, Jeffreys, Br. Conch. vol. iii, p. 250.

*Iothia fulva*, Gray (not Forbes), Syst. An. Figs. Moll. An. p. 93, 1854; Guide to Moll. p. 172.

*Patella rubella*, O. Fabr., Fauna Grönl. p. 386, No. 383.

*Pilidium rubellum*, Stimpson, Check List East Coast Shells, No. 312:

*Sp. ch.*—Shell patelliform, orange-fulvous, rarely paler, or even white; apex anterior, pointed, prominent. Sculpture, elevated radiating striæ, crossed by concentric imbricating lines of growth, forming reticulations of greater or less strength, and sometimes almost entirely absent. Interior smooth, polished, particularly European specimens. Long. .30, lat. .18, alt. .10 in. Apical defl. 108°. Ten specimens examined.

Soft parts. Body whitish; no eyes; tentacles short, stout, foot oval. Rostrum provided with short triangular appendages. Mantle entire fringed with short transparent cilia. No external branchiæ. (Jeffreys and Lovèn.)

Rhachidian tooth long, narrow rhomboidal, provided with a heavy central cusp and two small denticles. Laterals with slender shafts pointed at the bases; cusps broad, obliquely bent, striated beneath. (Lovèn.)

I have not been able to obtain specimens of the soft parts of this species, and quote Jeffreys and Lovèn.

*Patella rubella*, O. Fabr., seems to be a coarser, paler variety of the above, from authentic specimens.

N. B.—This species has been referred to the *Tecturidæ* by Jeffreys, apparently under the misapprehension that the dentition resembled the typical *Tectura*, from which it is widely removed. He states that *Tectura* has elongated and hooked laterals, and two central or rhachidian teeth; which is a mistake.

The dental formula of *Tectura* is 3^3 in the diagonal series, and there are no central teeth. It almost identically agrees with *Acmæa mitra*, Esch., which, according to Philippi, is (from the original specimen) the type of Eschsholtz' genus *Acmæa*, his *Acmæa mammilaris* being an eroded specimen of the same species. It is certainly not the same as Sowerby's *Lottia pallida*, which is certainly the same as *Scurria scurra*, d'Orb., from which *S. mitra* is likely to differ generically. It does not possess the remarkable frills between the mantle edge and the foot, figured by d'Orbigny and particularly noticed by Gray (Guide Moll. p. 172).



The foot of *Scurria mitra*, Esch., is oval, thin, smooth, and, like all the soft parts in life, of a livid white color. The edge of the mantle is complete, thickened and simple. The hood is generally perforated over the gill. There are no papillæ, tentaculæ, or anything of a like nature between the edges of the foot and mantle. The tentaculæ are long, rounded, with small black eyes on the outer bases. The muzzle or rostrum is short, provided with a well developed sucking disk around the mouth, with a rough surface and a continuous edge. Outside of this edge the outer edge of the rostrum forms a fold, which is terminated at either side by a round and conical papilla. The gill is laminar, triangular, thick; under the hood, out of sight; but points across the neck from right to left diagonally.

For details of dentition see fig. 5, A, from a specimen dredged in 4 fms. stony mud; Coal Harbor, Ounga Island, Alaska. Soft parts fig. 5, c, from a specimen from Monterey, Cal. Fig. 5, b, shell.

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PLATE 15.—*Explanation of figures.*

Fig. 1. *Lepeta caeca*, Gray.

- a, dentition (specimen from Norway).
- b, profile of do.
- c, extremely young magnified four times linear, showing the nucleus lying flat on the apex.
- d, shell, profile and outline, natural size.

Fig. 2. *Cryptobranchia concentrica*, Midd.

- a, dentition (specimen from Sitka).
  - b, profile of do.
  - c, animal in situ from below.
  - d, animal removed from shell, from above.
- (Posterior a little fore- }  
shortened.)                    } *o*, mantle edge; *p*, muscle; *x*, intestine; *y*, liver and ovary; *z*, genital and anal papilla.
- e, profile and outline of shell, natural size.
  - f, buccal plate, magnified.    g, muzzle from in front, magnified.

Fig. 3. *Cryptobranchia alba*, n. s.

- a, dentition.
- b, profile and outline, natural size.
- c, animal in situ, natural size.
- d, front view, mantle raised, magnified.

Fig. 4. *Pilidium fulvum*, Forbes.

a, dentition, laterals on one side removed to show form of Rhachidian tooth.

4 a, shell, natural size.

Fig. 5. *Scurria mitra*, Esch. (not Gray, Adams).

a, dentition, from a specimen dredged in 4 fms. N. Harbor, Ounga Island, Alaska.

b, outline and profile of small specimen.

c, soft parts, with mantle raised up.

Fig. 6. ? *Cryptobranchia instabilis*, n. s.

Shell natural size, outline and profile.

ON THE LAND AND FRESH-WATER MOLLUSCA OF  
NICARAGUA.

BY RALPH TATE.

## I. INTRODUCTION.

The district in which the species enumerated in this paper were collected comprises much of the south and central portions of the republic of Nicaragua.

Nicaragua presents two distinct types of soil, vegetation, and climate, and, in a limited degree, the land shells are restricted to one or other of the districts. These are :

(1) *Eastern District*.—A low mountain chain trends in a north-west and south-east direction through the central part of the country; it is composed of diorites and schistose rocks, yielding by decomposition a stiff argillaceous soil, which is clothed with a dense forest. This region extends to the Atlantic seaboard, the climate of which is excessively humid. I collected during a period of five months in that portion of this region known as Chontales, which is situated at from 1500 to 3000 feet above the sea level.

(2) *Western District*.—Two parallel chains of volcanic mountains occupy the western portion of Nicaragua. Here, from the absorbent nature of the rocks and the comparatively little rain, the chief vegetation is grass, but on the margins of the streams and on some of the alluvial flats there is a limited growth of timber trees. The general aspect of this region is that of savannas interspersed with wood.

The mountain range bordering the Pacific is the primary dividing ridge, and between it and the median chain extends a low valley stretching from the Gulf of Fonseca on the north into Costa Rica on the south; within this longitudinal valley is

situated the group of Central American lakes. The river San Juan, which discharges the surplus water of Lake Nicaragua, flows through a transverse valley to the Atlantic at Greytown.

All the species enumerated in this paper were collected to the east of the Pacific coast range.

The land shells which are limited to the volcanic country are *Helix griseola*, *Glandina rosea*, *Bulinus unicolor*, *B. discrepans*, *Helicina rostrata*, &c.; *Bulinus castus*, *Helix Parkeri*, *H. cœcoides*, *Tebennophorus auratus*, *Krynickia Americana*, and *Helicina denticulata*, are confined to the mountain forests.

All the *Unionida*, *Ampullaria*, *Tryonia*, *Planorbis*, *Neritina* and *Physa* were collected in the basin of the Lake Nicaragua and the San Juan; *Melania*, *Amnicola* and *Sphærium* being confined to the Chontales District.

## II. ENUMERATION OF THE SPECIES.

I would acknowledge here that I am under great obligation to Mr. Tryon for the majority of the specific determinations. The species enclosed within brackets are extra-limital. Excepting *Tebennophorus auratus*, all the species have been deposited in the Museum of the Society.

### 1. POMUS PYRUM, Phil.

Occurs in the river San Juan, its tributaries and creeks; in the river Panaloya, and in Lake Nicaragua at Grenada.

This species usually lives on the muddy bottom of still-water courses, and though sometimes observed floating on the surface of the water, yet if surprised in that position it immediately sinks to the bottom. The eggs are deposited in semi-pyriform masses on the stems of *Cyperus* and small trees growing in or at the margin of the water; the capsules are shelly, greenish-white, numerous, and by compression hexagonal. In every instance the aggregation of capsules was placed from a few inches to two and three feet above the highest level of the water, and it is beyond a doubt that the parent mollusc leaves the water for the purpose of nidification. The species of *Pomus* observed by me in South America have the same habit, whilst *Marissa* deposits its *gelatinous* egg-masses always *below* the surface of the water.

### 2. MELANIA GASSIESII, Reeve.

Lives on stones in the rocky beds of the clear, rapid-flowing streams taking their rise in the Chontales Mountains. The species is confined to Central America.

## 3. AMNICOLA PANAMENSIS, Tryon.

Collected at the roots of aquatic plants in a swampy pool near Javali, in the Chontales, at an elevation of 1750 feet.

## 4. TRYONIA ORNATA, Morelet.

On the muddy shores of Lake Nicaragua and in the pools by the margin of the same, La Playa, Grenada.

Of the desiderata to our knowledge of this genus I can only furnish that of the operculum, which is corneous, thin, subspiral, and radiately marked.

*T. ornata* is the third species of the genus; the others inhabit California.

## 5. NERITINA LISTERI, Ch.

Very abundant on the rhizomes of aquatic plants throughout the river San Juan. In Greytown harbor, where this species and *Planorbis tumidus* live, the water is alternately brackish and fresh, according as to whether the tide is flowing or ebbing.

## 6. NERITINA VIRGINEA, Lam.

With *Cyrena solida*, Phil., on sandy bottom, brackish water pools, Punta-Arena, Greytown; nidifying on dead shells of *Cyrenæ* and on each other; very abundant. Also at Salt Creek, Costa Rica, and Boca del Toro, Panama. This species is truly estuarine.

## [NERITINA INTERMEDIA, Brod.]

On the bottom of a small fresh-water stream by the railway terminus, Panama City.]

## 7. TEBENNOPHORUS AURATUS, Tate.

*Animal* elongated, slender, attenuated behind, convex, shining, smooth; *mantle* reaching to nearly the edge of the foot, from which it is separated by a groove; yellowish-grey, with numerous small white and gold spots, and fewer and larger black ones, the last forming a black streak on the upper lateral margin; *foot* narrow, extending a little beyond the mantle, pointed behind, truncated in front, where it is of a reddish-yellow color, other portion whitish-grey; tentacles four, upper black, one-tenth of an inch in length, lower tentacles very short.

*Dimensions*.—Extended length, .8 inch; breadth when extended, .1 inch; respiratory orifice, from the front, .15 inch; contracted length, .5 inch.

This species is not uncommon under stones and on decaying timber, Javali, Chontales.

8. *KRYNICKIA AMERICANA*, Tate. Plate 16, fig. 1.

*Animal* slender, pointed behind, back convex, granulated; *mantle* .275 inch in length, free as far as the respiratory orifice, brownish-black and smooth; *color* of body grey, with black in the grooves, giving the general appearance of a brownish-black; head and tentacles of a lighter color; edge of foot with defined crenulated border; foot grey, and divided into three bands. *Jaw* horse-shoe shaped, with a median projection; it is analogous to that, less the posterior plate, of *Succinea putris*. Lingual dentition consists of straight rows of about fifty plates; the median plate obscurely tricuspid; the laterals bearing two subulate or symmetrical cusps. *Shell* represented by a thin semi-opaque membrane.

Inhabits under stones and about houses, Javali, Chontales, where it is not uncommon. This slug is very active, moving about at night, and can suspend itself by its mucus.

Though this animal resembles *Limax agrestis* and *L. campestris*, and so much the latter as to give rise to doubt as to their specific distinctness, yet the character of the mantle, which determines its position in the old-world genus *Krynckia*, alone distinguishes my species.

GUPPYA, Tate.

*Stenopus*, Guilding (name preoccupied).

*Conulus*, Guppy (1868), non Moquin-Tandon.

*Examples*.—*Helix Gundlachi*, Pfr.; *Conulus vacans*, Guppy.

*Animal* related to that of *Zonites*; foot truncated, furnished with a mucus pore and retractile appendage; median part of foot defined. "Lingual dentition in *G. vacans*  $30 \cdot 5 \cdot 0 \cdot 5 \cdot 30$ ; teeth broad, subequal, first five laterals symmetrical, with a large rounded cusp having a smaller cusp of similar shape on each side; outer laterals bicuspid, resembling the teeth of *Testacellus*."—Guppy. *Shell* small, trochiform, subperforate, thin, shining, finely and longitudinally striated, lip acute.

Mörch, misreading the author's description of the lingual dentition of *Conulus vacans*, Guppy, writes that it "doit former un genre à part, le genre *Guppya*; les dents ressemblent à celles des *Testacella*," whereas the laterals only resemble those of that genus. However, I have adopted Mörch's name with much pleasure in compliment to my friend,—a most accurate and zeal-



ous observer in Natural History, and who has so extensively contributed to our knowledge of the molluscan fauna, recent and fossil, of the Antilles.

The genus *Guppya* occupies a determinate position among the genera to which it is related, either by the lingual dentition or the pedal characters; in a few words, it has the shell of *Conulus*, with the pedal peculiarities of *Nanina*, the animal of which presents many distinguishing features.

#### 9. GUPPYA GUNDLACHI, Pfr. sp.

Whatever specific name should be applied to the species under consideration, it undoubtedly belongs to the generic group having *G. vacans* as a type.

The foot is white underneath, light grey, with a bluish-black streak above, truncated, but slightly acuminate inferiorly, caudated superiorly, and provided with a mucus pore; eye tentacles blackish-red, the inferior tentacles grey.

Living among moss on trees, Chontales forest and forest by the river San Juan, Toro Rapids; it inhabits Cuba.

#### 10. HELIX GRISEOLA, Pfr.

Common throughout the savanna region, Masapa, Grenada, San Ubaldo, &c., living on the blades of grass, and resembling in its habit *H. virgata*, &c. It is quoted from Texas and Mexico, but is not enumerated among the Guatemalan species by Tristram.

#### 11. HELIX CÆCOIDES, Tate. Plate 16, fig. 2.

Shell small, conoidally globose, minutely perforate; whorls four, convex, suture deep; the *epidermis* somewhat shining, horny brown, rising into distant equal rugulose oblique lamellæ; aperture nearly circular, a little oblique; *peristome* acute. Diameter and height one-tenth of an inch.

The shell of this species is closely related to *H. caeca*, Guppy, *H. Jerensis*, Guppy, and, with *H. bracticola*, Guppy, and *H. n. sp.* (San Lucia, Tate), constitute a group which has *H. lamellata* in Europe, and *H. labyrinthica*, in North America, for analogues.

*H. cæcoides* lives among moss on trees, in company with *Guppya Gundlachi*, Chontales forest.

#### 12. HELIX BLAKEANA, Tate. Plate 16, fig. 3.

Shell depressed, small, semitransparent, shining; *epidermis* greenish, strongly and regularly concentrically costulate, interstitial spaces obscurely striated; *whorls* four, rounded, rapidly

enlarging; *suture* deeply impressed; spire slightly elevated; *umbilicus* wide, deep, exposing all the whorls; outer lip sharp. Diameter 0.125 inch; height 0.075 inch.

The shell of this species has great affinity to that of *H. minutissima*, Lea, and *H. milium*, Morse.

*H. Blakeana* inhabits the Chontales forest; one specimen only was preserved. It is dedicated to Dr. C. Carter Blake, my late colleague in Nicaragua, in pleasing remembrance of his assistance and genial companionship in many excursions.

? *HELIX* sp. "As large as *H. Pomatia*, at Acota." Blake.

[*HELIX* *PLICATA*, Born.

Forest, north shore of Naval Bay, Colon.]

### 13. *BULIMUS ZEBRA*, Müller.

Throughout the country; living in small isolated colonies on the trees in the Chontales forest.

### 14. *BULIMUS BERENDTI*, Pfr.

Forest on the banks of the river San Juan, Castillo, and Toro Rapids. Recorded from Bolivia.

### 15. *BULIMUS UNICOLOR*, Sowerby.

In copses in the savanna region, Grenada, Masapa, and San Nicolas. Also occurs in Panama.

### 16. *BULIMUS PARVUS*, Lea.

Living with *B. unicolor*.

### 17. *BULIMUS CASTUS*, Pfr. ? (juvenis.)

Javali and on Peña Blanca, at about 2500 feet elevation; in the Chontales forest.

### 18. *BULIMUS MACULATUS*, Lea.

Copses in the savanna region, San Nicolas. Recorded from New Grenada.

### 19. *BULIMUS DISCREPANS*, Sowb.

Savanna region, Grenada, Masapa, San Nicolas.

### 20. *BULIMUS COSTATO-STRIATUS*, d'Orbigny.

At the bases of trees in the savannas, San Nicolas, and Grenada, and in the moist forest on the San Juan, Toro Rapids. This species also inhabits Cuba.

21. *BULIMUS MIMOSARUM*, d'Orb.

On wet rocks and among weeds in the fossé to the fort at Castillo; very abundant. Recorded from Bolivia.

[*BULIMUS TRYONIANUS*, Tate. Plate 16, fig. 4.

Shell conically subulate, semipellucid, not umbilicated, whorls seven in number, rather flattened, shouldered at the suture, ornamented with numerous nearly straight longitudinal costæ, interstitial spaces smooth; suture somewhat impressed; columella a little thickened; aperture elliptical; outer lip straight and simple.

Total length of shell .22 inch; breadth 0.075 inch; height of last whorl 0.075 inch.

In the forest on an island in the lagoon of Boca del Toro, on the borders of Panama and Costa Rica.]

[*BULIMUS PLICATELLUS*? Guppy (*Stenogyra*).

The examples collected appear to be young shells of this West Indian species. Living with *B. Tryonianus*, &c. Boca del Toro.]

22. *ACHATINA OCTONA*, Chem.

Throughout the savanna region, Grenada, San Ubaldo, and at Castillo and Greytown, Nicaragua. Also at Boca del Toro, Naval Bay, and Matachin, Panama.

[*TORNATELLINA INTERSTRIATA*, Tate. Plate 16, fig. 5.

Shell acuminate oblong, subdiaphanous, light horn color, shining, ornamented with many sinuate longitudinal costæ, the interstitial spaces with about three costellæ; whorls 7—8, convex, suture well defined; apex blunt, smooth; aperture elliptical; outer lip thin, simple, straight; columella obliquely truncate, twisted, reflexed, forming an umbilical fissure; no parietal plait; last whorl forming nearly half the length of the shell.

<i>Dimensions</i> .—Total length of shell,	.375	.35
Height of last whorl,	.175	.17
Breadth of shell,	.175	.17

Living in company with *Bulinus Tryonianus*, &c. Boca del Toro, Panama.]

23. *TORNATELLINA HYALINA*, Tate.

Related to *T. interstriata*, hyaline, with a higher and more inflated body whorl.

Total length .23 inch; height of last whorl .12; breadth .15.

One specimen only was obtained with *Bulinus Berendti*, Toro Rapids.

24. GLANDINA ———

Woods near Grenada.

25. GLANDINA ROSEA, Fer.

Throughout the savanna region, sheltering under the leaves of pinnellas (*Bromelia pinguis*). Grenada, Masapa, San Ubaldo, &c.

26. GLANDINA DYSONI, Pfr.

With *Bulinus mimosarum* in the fossé to the Castillo Fort, also in the forest near Toro Rapids.

27. SUCCINEA INFLATA, Lea.

Dead shells, San Nicolas and San Ubaldo. It inhabits also the southern States of the American Union.

28. SUCCINEA RECISA, Morelet.

On the marshy borders of the river San Juan and Lake Nicaragua, at San Carlos; on wet rocks at the waterfall, Javali brook, Chontales. It is recorded from Panama.

29. VAGINULUS FLORIDANUS, Binney.

Under stones, Javate, Chontales; probably the same species, but twice the size; Toro Rapids. Inhabits Florida.

30. PHYSA SQUALIDA, Morelet.

Pools bordering Lake Nicaragua at Grenada, and in a creek of the San Juan, Toro Rapids.

31. PHYSA PURPUROSTOMA, Tristram.

Var. *ventricosa*. In a small stream at San Nicolas.

32. VELLETTIA EXCENTRICA, Morelet.

Pools and streams, on aquatic plants, Chontales district, San Nicolas, and San Augustin.

33. PLANORBIS TUMIDUS, Pfr.

Lake Nicaragua, and the river San Juan to its mouth. The above localities mark for the present the southern limit of this species, which ranges through Gautemala and Mexico to Texas, and occurs in Cuba.

34. PLANORBIS KERMATOIDES, d'Orb.

*Planorbis Duenasianus*, Tristram.

Marshy pools, San Augustin, near Acoyapa.

35. *PLANORBIS DECLIVIS*, Tate.

*Shell* orbicular, depressed, light horn colored, somewhat shining, strongly and regularly wrinkled across; *whorls* four to five, rounded, suture deep, the last two whorls flat above and below, concealing the others; the spire and umbilicus deeply and abruptly impressed; last whorl suddenly deflected at the aperture, which is horizontal and nearly circular; peristome united all round; outer lip slightly reflected.

Dimensions of adult shell: greater diameter .25 inch; height .075 inch.

Marshy pools San Augustin near Acoyapa, living in company with *Planorbis kermatoides* and *Velletia excentrica*.

36. *PLANORBIS FIELDII*, Tryon.

Distinguished from *P. Havanensis*, Pfr., by being more depressed, and in the white opacity of the under side of the shell. Diam. .35 inch; height .1 inch.

Pools by margin of Lake Nicaragua at Grenada. Panama (Field).

37. *CYCLOTUS TRANSLUCIDUS*, Sow.

In the Chontales forest, where it is not uncommon, ascending the Peña Blanca to an elevation of nearly 3000 feet; it is sparsely distributed in the savanna region.

## 38. C. ———

San Nicolas.

39. *HELICINA DENTICULATA*, Pfr.

The *operculum* is solid, purplish-brown, granulated. Ascending trees, Chontales forest, where it is rare; it is known in Honduras.

40. *HELICINA ROSTRATA*, Morelet.

*Syn.*—*H. Salvini*, Tristram.

In the savanna region, San Diego; it is a Guatemalan shell.

41. *HELICINA TURBINATA*, Wieg.

Forest, Toro Rapids; hitherto only known from Mexico.

[*HELICINA SEMISTRIATA*, Sow.

In the woods and cocoanut groves about Boca del Toro.]

42. *SPHERIUM MERIDIONALE*, Prime.

Marshy pool near Javali, Chontales. Panama (Prime).

The method I have employed to collect the shell of this and other species, which are too minute to be taken by a scoop, is by pulling up by the roots the submerged plants, and washing them in a large bottle of water. The finer mud being removed by agitation of the water, the shells were searched for in the coarser sediment.

*S. meridionale* is very active, and climbs the sides of a vessel with great facility.

43. CYRENA SOLIDA, Phil.

With *Neritina virginea* in brackish water pools, Greytown, burrowing to a depth of one or two inches in the sandy bottom. Recorded from Belize.

44. UNIO ROWELLI, Lea.

Rivers Malacatoya and Estar, Nicaragua. Chagres river, New Grenada (Lea).

45. UNIO GABBIANA, Lea.

North shore of Lake Nicaragua.

46. UNIO ———

North shore of Lake Nicaragua.

47. UNIO ———

River Tipitapa (or Panaloya).

48. ANODONTA BRIDGESII, Lea.

River Tipitapa, and sand-bar north of river Estar, Lake Nicaragua.

The largest specimen collected measures four and a half inches in length.

49. ANODONTA INÆQUALIS, Lea.

Lake Nicaragua, near San Ubaldo, and River Malacatoya.

50. ANODONTA LUTEOLA, Lea.

River at Tierra Blanca and River Malacatoya.

51. MYCETOPUS WEDDELLI, Hupé.

The genus *Mycetopus*, hitherto limited in the western hemisphere to tropical South America, is represented in Nicaragua by one species, the identity of which with the Brazilian form is somewhat doubtful in the absence of specimens for comparison. The Central American analogue appears to present differences



in size and coloration, but which alone cannot be regarded as of specific value. The color of the Nicaraguan shell is yellow horn, without green bands, shining, and marked with faint radiating lines. The dimensions of the largest specimen are as follows: Total length 3.35 inches; height .95 inch; thickness .5 inch; length of anterior side .9 inch.

*M. Weddelli* was collected on the muddy margins of the river Tipitapa.

Collecting *Unionidae* in tropical countries can only be successfully pursued during the dry season, as during the rainy season the species are in comparatively deep water, and cannot be gathered except by means of a dredge, the employment of which under such circumstances I would recommend. An examination of rivers and lakes at the two seasons will give widely different results as regards the presence and abundance of these forms of molluscan life. The *Unionidae* inhabiting large sheets of water are presumed to be littoral; certainly in Lake Nicaragua the upper limit of their distribution is that of low-water mark, but their extension in depth is not known. All the species I have recorded are littoral, but whether they are confined to this zone, or that other species replace them in deep water, are unsolved problems. The thin-shelled species are largely preyed upon by herons and other birds, and often much to the annoyance of the collector. During my travels in Venezuela once only did I meet with *Unionide*,—on the margins of a lake-like expansion of the river Carichapo; but not a single perfect shell did I secure, though innumerable fragments strewed the shore, they having broken all the valves left by the lowering of the level of the water.

The following molluscs recorded from Nicaragua did not occur to me: *Helix Parkeri*, *Helicina meridigera*, *Cyrena sordida*, *Unio aratus*, *Unio cyrenoides*, *Unio Newcombianus*, *Anodonta Nicaragua*.

### III. RELATION TO OTHER FAUNAS.

The molluscan fauna of Nicaragua presents no marked facies, and is characterized by the absence of, rather than the presence of peculiar genera. The geographical position of Nicaragua leads us to infer that the species of shells would be in common with those of the Mexican province on the one hand, and with those of the Columbian province on the other, and such is the case. Thus, whilst *Bulimus Berendti*, *B. unicolor*, *B. maculatus*, *B. mimosarum*, *Planorbis Fieldii*, *Cyclotus translucidus*, *Amnicola*

*Panamensis*, *Unio Rowelli*, *Sphærium meridionale*, and *Mycetopus Weddelli* ally the fauna specifically to that of tropical South America, *Helix griseola*, *Glandina Dysoni*, *Succinea inflata*, *Vaginulus Floridanus*, *Planorbis tumidus*, *Helicina tuberculata* and *H. turbinata* are more northern forms, which in Nicaragua commingle with those of a more southern origin. *Bulinus zebra*, *Achatina actona* and *Cyclotus translucidus* are common to Central America, South America and the Antilles; *Guppya Gundlachi* and *Bulinus costato-striatus* are Cuban species. The only species common to Nicaragua and the neighboring State of Gautemala are *Melania corvina*, *Bulinus zebra*, *Achatina octona*, *Physa purpurostoma*, *Planorbis tumidus*, *Planorbis Kermatoides*, *Cyclotus translucidus*, *Helicina rostrata*, and *H. merdigera*. Generically *Tebennophorus* is North American, *Glandina* Central American, whilst *Mycetopus* and *Tornatellina* are South American.

The land snails of Gautemala, Honduras, Yucatan and Mexico resemble those of the West Indies in the prevalence of *Cylindrella*, *Macroceramus*, *Adamsiella*, *Megalomastoma*, *Chondropoma*, *Cistula*, and *Tudora*, none of which genera have been observed in Nicaragua and south to the Isthmus of Darien. This circumstance, viewed in connection with the distribution of the Nicaraguan species, points to a different origin for the fauna, and I am thereby induced to regard Nicaragua as comprised within the Columbian Region of the distribution of land shells, and not within that of Mexico.

# DESCRIPTIONS OF NEW SPECIES OF MARINE MOLLUSCA.

BY WESLEY NEWCOMB, M.D.

MITRA WILLIAMSI, Newc.—Plate 17, fig. 1.

M. testa elongato-ovata, crassa, undique transversim costata; inter costas sublente in longitudinem striata; anfr. 6, subplanis; ultimo in longitudine reliquis æquali; apice obtusula; sutura obscura impressa; columella subtorta indistincte quadriplicata; colore alba cum flammeus lineis irregulariter in longitudinem picta.

Long. .6 pol.; lat. .2 pol.; long. aper. .3 pol.; lat. aper. .05 pol.

*Hab.*—Philippine Islands. ?

Shell elongately ovate, thick, wholly transversely costate, under the lens longitudinally striate between the ribs; whorls 6, flattish, the last equal to the rest in length; apex somewhat obtuse; suture slightly impressed; columella scarcely twisted, with 4 plications, the last indistinct. Color white with orange flammules arranged longitudinally.

*Remarks.*—This little shell collected by Captain Saml. J. Masters at the Philippines or at Guam, has been submitted to the critical eye of Mr. Cuming, who pronounced it new; and not being able to find it in any of the great European collections, I have, after a delay of some 12 years, decided to describe it:—I take pleasure in attaching the name of Prof. Williams, of Ithaca, to this beautiful species.

MODIOLA PEASEI, Newc.—Plate 17, figure 2.

M. testa tenui, polita, luteo albida, tenuissime striata; parte postera cum lineis et fasciculis fuscis inosculatisque picta; intus margaritacea-alba.

Long. 8-10 pol.; lat. 4-10 pol.

Shell thin, polished, yellowish-white, finely striated; posterior portion with brown lines in bundles crossing and connecting with each other.

*Hab.*—Sandwich Islands, dredged in 12 fathoms, outer harbor of Honolulu.

This is one of the most beautiful species of the Genus *Modiola* of Lam. The peculiar color and fine brown markings are sufficient characteristics of the species, which otherwise is most simple in its characters. Only a solitary specimen was dredged in the outer harbor of Honolulu, and I take pleasure in attaching to it the name of one of our most industrious and enterprising living naturalists.

PROTO CORNELLIANA, Newc.—Plate 17, figure 3.

*P. testa* elongata, solida, alba, nitida, sublente longitudinaliter costata et transversim subtiliter striata; apice sinister; anfr. octo, orbiculatis, quarto et septimo cum obscura varice; sutura fere transversa sub-profunda, lata, et obscure dentata; apertura rotunde ovata; labro crasso et obscure bilabiato.

Long. 4-10 pol.; Lat. 1-10 pol.; apertura 1-20 pol.

Shell elongate, solid, white, shining, under the lens longitudinally ribbed and very finely transversely striate; apex sinistral; whorls 8, rounded, the 4th and 7th with an obscure varix; suture nearly transverse, wide, rather deep and obscurely dentate; aperture entire, roundly ovate; lip thickened and indistinctly bilabiate.

*Remarks.*—The genus *Proto* was made in 1824, by DeFrance, for the reception of a species (*P. Maraschini*), with claims more decided, so far as the shell is concerned, than hundreds of the recently manufactured artificial Genera which encumber our present nomenclature. Its "restoration," or re-union with *Turritella*, as declared by Chenu, is not fortunate, for its affinities are much nearer *Chemnitzia* (*Turbonilla*) than to *Turritella*. I have taken the liberty of attaching the name of Mr. Cornell to this beautiful species, which was dredged in twelve fathoms of water outside the reef near Honolulu, Sandwich Islands.

## DESCRIPTION OF A NEW AMERICAN HELIX.

BY WESLEY NEWCOMB, M. D.

## HELIX HEMPHILLII, Newc.—Plate 17, fig. 4.

*H. testa* sub-lenticulare, late umbilicata, tenuiuscula, corneo-albida cum fuscis lineis obscuris picta, transversim rugoso-striata, apice obtusa; anfr. 5, supra convexa vel planulati, ultimus acute carinatus vel bicarinatus, descendens, basi convexus et in longitudinem tenuissime striatus; umbilico profundo perspective; peristoma simplex; apertura diagonalis, fere rotunda.

Juniores—acute carinatae, basi perconvexae, omnino hirsutae cum brevissimis setis.

Diam. major (adulta) .625 pol.; diam. minor .55 pol.; altitude .40 pol.

Shell nearly lens shaped, widely umbilicate, thinish; white horn color masked with obscure brownish lines (or without), transversely roughly striated, with an obtuse apex. Whorls five, either convex or flattened above, the last one acutely carinate, or bicarinate, descending in front, base convex with fine longitudinal striae; umbilicus deep and perspective; lip simple; aperture diagonal, nearly round.

*Hab.* White Pine Mining District, at an altitude of 8000 feet.

The above, collected by Henry Hemphill, Esqr., bears some analogy to *H. strigosa*, Gould, and to *H. Cooperi*, Bland, but is readily distinguished from either of those species. The hirsute character of the young shell, the larger size and more compressed form, distinguish it from *Cooperi*; its strong carination, flattened form and less size, together with the variation in the young, separate it from *strigosa*.

CATALOGUE OF THE SHELLS OF THE COOSA RIVER,  
ALABAMA.

BY JAMES LEWIS, M.D.

Among the Rivers of the United States noted for the number of species of Mollusca that inhabit them, the Coosa River, in Alabama, may be considered first. The following list of species was compiled from various sources; principal among them may be mentioned the "Observations" of Mr. Isaac Lea, in which will be found descriptions and figures of by far the greater part of the species. Much aid has also been derived from specimens furnished by Dr. E. R. Showalter, of Uniontown, Ala., who has also kindly furnished much valuable information. The manuscript has also been submitted to the criticism of Dr. W. D. Hartman, of West Chester, Pa., and to Mr. Chas. M. Wheatley, of Phoenixville, who have likewise offered valuable suggestions.

The nomenclature of the *Unionidæ* in the following tables is that adopted by Mr. Isaac Lea; that of the *Strepomatidæ*, with a few trifling deviations, will be found in accordance with the synonymy of this family as given by Mr. G. W. Tryon, Jr. It is possible that some known species have been either inadvertently omitted or unjustly excluded by reasons of erroneous views of synonymy; and on the other hand it is probable that the number of species, when carefully studied, will be found to be really less than the tables indicate, as there are very urgent reasons for suspecting that many of the nominal species are really only varieties. But the subject is beset with too many difficulties to warrant any attempt to reduce synonymy in connection with this compilation.



## UNIO, Brug.

1. U. acutissimus, *Lea.*
2. " aretatus, *Lea.*
3. " asperatus, *Lea.*
4. " atro-costatus, *Lea.*
5. " Blandianus, *Lea.*
6. " Boykinianus, *Lea.*
7. " consanguineus, *Lea.*
8. " cornutus, *Barnes.*
9. " decisus, *Lea.*
10. " decumbens, *Lea.*
11. " dolosus, *Lea.*
12. " excavatus, *Lea.*
13. " fibuloides, *Lea.*
14. " germanus, *Lea.*
15. " glandaceus, *Lea.*
16. " Foremanianus, *Lea.*
17. " Hartmanii, *Lea.*
18. " interventus, *Lea.*
19. " Johannis, *Lea.*
20. " lens, *Lea.*
21. " Lewisii, *Lea.*
22. " medius, *Lea.*
23. " metanever, *Raf.*
24. " metastriatus, *Lea.*
25. " nucleopsis, *Con.*
26. " ornatus, *Lea.*
27. " parvulus, *Lea.*
28. " pauperculus, *Lea.*
29. " penitus, *Con.*
30. " perovalis, *Con.*
31. " ? perplicatus, *Con.\**
32. " planus, *Lea.*
33. " porphyreus, *Lea.*
34. " pulvinulus, *Lea.*
35. " pustulosus, *Lea.*
36. " pyramidatus, *Lea.*
37. " rubidus, *Lea.*
38. " Showalterii, *Lea.*
39. " stabilis, *Lea.*
40. " trinacris, *Lea.*
41. " unicolor, *Lea.*
42. " verus, *Lea.*

## MARGARITANA, Schum.

43. M. Holstonia, *Lea.*

## ANODONTA, Lam.

44. A. Showalterii, *Lea.*

## ANCULOSA, Say.\*

45. A. ampla, *Anth.*
46. " contorta, *Lea.*
47. " ? Downiei, *Lea.*
48. " ligata, *Anth.*
49. " rubiginosa, *Lea.*
50. " Showalterii, *Lea.*
51. " tæniolata, *Con.*
52. " vittata, *Lea.*
53. " zebra, *Anth.*

## ACROLOXUS, Beck.

54. A. filusus, *Con.*

## ANCYLUS, Geoffroy.

55. A. elatior, *Anth.*

## EURYCÆLON, Lea.

56. E. midas, *Lea.*
57. " nubila, *Lea.*

## GONIOBASIS, Lea.

58. G. æqua, *Lea.*
59. " Alabamensis, *Lea.*
60. " ampla, *Anth.*
61. " aretata, *Lea.*
62. " auriculæformis, *Lea.*
63. " bellula, *Lea.*
64. " Binneyana, *Lea.*
65. " bullula, *Lea.*
66. " calculoides, *Lea.*
67. " capillaris, *Lea.*
68. " carneola, *Anth.*
69. " clausa, *Lea.*
70. " Coosaensis, *Lea.*
71. " crenatella, *Lea.*

\*Possibly atro-costatus, *Lea.*

\* The genera of the Univalves are alphabetically arranged.

72. *G. crepera*, *Lea*.
73. " *culta*, *Lea*.
74. " *decorata*, *Anth*.
75. " *ellipsoides*, *Lea*.
76. " *elliptica*, *Lea*.
77. " *expansa*, *Lea*.
78. " *fabalis*, *Lea*.
79. " *fallax*, *Lea*.
80. " *fascinans*, *Lea*.
81. " *fumea*, *Lea*.
82. " *furva*, *Lea*.
83. " *Gerhardtii*, *Lea*.
84. " *glandaria*, *Lea*.
85. " *gratiosa*, *Lea*.
86. " *harpa*, *Lea*.
87. " *Haysiana*, *Lea*.
88. " *impressa*, *Lea*.
89. " *læta*, *Jay*.
90. " *Lewisii*, *Lea*.
91. " *luteola*, *Lea*.
92. " *melles*, *Lea*.
93. " *negata*, *Lea*.
94. " *oliva*, *Lea*.
95. " *osculata*, *Lea*.
96. " *ovalis*, *Lea*.
97. " *pergrata*, *Lea*.
98. " *perstriata*, *Lea*.
99. " *propria*, *Lea*.
100. " *pudica*, *Lea*.
101. " *punicea*, *Lea*.
102. " *pupæformis*, *Lea*.
103. " *quadricinata*, *Lea*.
104. " *quadrivittata*, *Lea*.
105. " *rara*, *Lea*.
106. " *rubicunda*, *Lea*.
107. " *Shelbyensis*, *Lea*.
108. " *Showalterii*, *Lea*.
109. " *solidula*, *Lea*.
110. " *spurca*, *Lea*.
111. " *straminea*, *Lea*.
112. " *tecta*, *Anth*.
113. " *tenera*, *Anth*.
114. " *tenebro-vittata*, *Lea*.
115. " *Vanuxemensis*, *Lea*.
116. " *varians*, *Lea*.

117. *G. variata*, *Lea*.
118. " *Vauxiana*, *Lea*.
119. " *virgulata*, *Lea*.
120. " *Wheatleyi*, *Lea*.

#### LIOPLAX, Troschel.

121. *L. cyclostomatiformis*, *Lea*.

#### LITHASIA, Haldeman.

122. *L. brevis*, *Lea*.
123. " *cylindracea*, *Lea*.
124. " *fusiformis*, *Lea*.
125. " *nuclea*, *Lea*.
126. " *vittata*, *Lea*.
127. " *Wheatleyi*, *Lea*.

#### MELANTHO, Bowditch.

128. *M. ponderosa*, *Say*.

#### NERITELLA, Humphrey.

129. *N. Showalterii*, *Lea*.

#### SCHIZOSTOMA, Lea.

130. *S. Alabamense*, *Lea*.
131. " *amplum*, *Anth*.
132. " *Anthonyi*, *Reeve*.
133. " *Babylonicum*, *Lea*.
134. " *Buddii*, *Lea*.
135. " *bulbosum*, *Anth*.
136. " *cariniferum*, *Anth*.
137. " *castaneum*, *Lea*.
138. " *constrictum*, *Lea*.
139. " *demissum*, *Anth*.
140. " *ellipticum*, *Lea*.
141. " *excisum*, *Lea*.
142. " *glandulum*, *Lea*.
143. " *glans*, *Lea*.
144. " *globosum*, *Anth*.
145. " *incisum*, *Lea*.
146. " *laciniatum*, *Lea*.
147. " *Lewisii*, *Lea*.\*

\*Manuscript.

- 148. *S. nuculum*, *Anth.*
- 149. " *pagoda*, *Lea.*
- 150. " *pumilum*, *Lea.*
- 151. " *salebrosum*, *Anth.*
- 152. " *Showalterii*, *Lea.*
- 153. " *sphaericum*, *Anth.*
- 154. " *Wetumpkaense*, *Lea.*
- 155. " *Wheatleyi*, *Lea.*

#### SOMATOGYRUS, Gill.

- 156. *S.* ——— ? species.

#### STREPHOBASIS, Lea.

- 157. *S. pumilum*, *Lea.*

#### TRYPANOSTOMA, Lea.

- 158. *T. annulifera*, *Con.*
- 159. " *Brumbyi*, *Lea.*
- 160. " *canaliculatum*, *Say.*
- 161. " *canalitum*, *Lea.*
- 162. " *Chackasahense*, *Lea.*
- 163. " *Christyi*, *Lea.*

- 164. *T. Conradii*, *Tryon.*
- 165. " *Currierianum*, *Lea.*
- 166. " *cylindraceum*, *Lea.*
- 167. " *dignum*, *Lea.*
- 168. " *excurvatum*, *Con.*
- 169. " *filum*, *Lea.*
- 170. " *Foremanii*, *Lea.*
- 171. " *gracilis*, *Lea.*
- 172. " *Hartmanii*, *Lea.*
- 173. " *incurvum*, *Lea.*
- 174. " *prasinatum*, *Con.*
- 175. " *Roanensis*, *Lea.*
- 176. " *Showalterii*, *Lea.*
- 177. " *Troostii*, *Lea.*
- 178. " *Tuomeyi*, *Lea.*
- 179. " *validum*, *Anth.*
- 180. " *viridula*, *Lea.*

#### TULOTOMA, Haldeman.

- 181. *T. bimonilifera*, *Lea.*

#### VIVIPARA, Lamarck.

- 182. *V. Coosaensis*, *Lea.*

DESCRIPTION OF NEW SPECIES OF MARINE BIVALVE  
MOLLUSCA IN THE COLLECTION OF THE ACADEMY OF  
NATURAL SCIENCES.

BY GEORGE W. TRYON, JR.

PHOLADIDÆ.

1. CYRTOPLEURA EXILIS, Tryon.—Plate 14, fig. 2.

*Description*.—Shell long and narrow, covered with numerous scabrous radiating ribs, except a narrow surface parallel with the posterior dorsal margin which is smooth. Widely gaping anteriorly, acuminate posteriorly. Dorsal lamina?

Length 10, width 30 mill.

*Hab*.—Ins. St. Croix, West Indies.

*Remarks*.—This species, collected and presented to the Academy by the late Dr. R. E. Griffith, has heretofore been confounded in our collection with *C. crucigera*, Sowerby, a Panama species; it is, however, smaller and narrower, and belongs, it will be perceived, to a different fauna.

MACTRIDÆ.

2. MACTRA GABBI, Tryon.—Plate 16, fig. 7.

*Description*.—Shell oval, nearly equilateral, thin, depressed, beaks narrow, not prominent, with a slight raised line radiating to the margin, smooth, light corneous.

Length 31, width 40 mill.

*Hab*.—Lower California. Wm. M. Gabb.

*Remarks*.—This species I cannot approximate closely to any other in the genus; its equilateral regularly oval form, small umboes and thin texture will serve to distinguish it. Two specimens are in our collection.

## 3. LUTRARIA COSTATA, Tryon.—Plate 16, fig. 6.

*Description*.—Shell elongately ovate, rather arcuate, middle surface compressed, broadly rounded at the end margins, irregularly concentrically ribbed, thin, white.

Length 27, width 52 mill.

*Hab*.—Senegal.—Dr. R. E. Griffith.

*Remarks*.—This shell is most nearly allied to *L. impar*, Deshayes, from Australia, which has the same concentric wrinkles or ribs, more prominent at the ends, but that species is wider and the ends are truncately squared.

## TELLINIDÆ.

## 4. HIATULA NITENS, Tryon.—Plate 16, fig. 9.

*Description*.—Shell ovately transverse, somewhat inequilateral, convexly flattened over the umboes, sides and ventral margin well rounded, thin, purple, with a very thin shining horn-colored epidermis, purple within.

Length 26, width 50 mill.

*Hab*.—New Zealand.—Dr. T. B. Wilson.

*Remarks*.—We possess a single specimen of this beautiful species. It has some of the characteristics of *H. nitida*, Gray, from the same locality, but is more swollen, and is not angled and acuminate posteriorly.

## 5. SANGUINOLARIA ROBERTSII, Tryon.—Plate 16, fig. 8.

*Description*.—Shell ovately transverse, rather thin, swollen, impressed flexuously from the umboes to the posterior ventral margin; beaks prominent, narrow. White, tinged with delicate rose color under an extremely thin, fugacious horn-colored epidermis.

Length 24, width 37 mill.

*Hab* —Philippines.

*Remarks*.—This species is nearly related to *S. sanguinolenta*, of the West Indies, but is smaller, more delicate and more convex.

## PECTINIDÆ.

## 6. PECTEN RUSCHENBERGERII, Tryon.—Plate 14, fig. 1.

*Description*.—Shell suborbicular, somewhat inequilateral,

rather thin and compressed, beaks very narrow and pointed, not prominent. Surface covered with about thirty not very prominent rounded ribs from which spring sharply-vaulted scales, a smaller smooth rib between each pair of scaly ribs, and occasionally separated from them by one or two raised lines. Color uniform brownish red.

Length 77, width 72 mill.

*Hab.*—Bay of Muscat.—Dr. W. S. W. Ruschenberger, U.S.N.

*Remarks.*—This very fine species belongs to a group embracing *P. asperimus*, Lam., *P. prunum*, Reeve, etc.; it is distinguished from all of them by the pattern of its ribbing. I take great pleasure in dedicating this species to the presiding officer of the Conchological Section of the Academy of Natural Sciences, in recognition of the intelligent zeal with which he has, through a long series of years, labored to augment our collections.



NOTICES AND REVIEWS  
OF  
NEW CONCHOLOGICAL WORKS.

BY GEO. W. TRYON, JR.

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I.—AMERICAN.

**Land and Fresh Water Shells of North America. PART I. Pulmonata Geophila.** By WM. G. BINNEY and THOMAS BLAND. 8vo., 316 pp. Smithsonian Institution, Washington, D. C., February, 1869.

This work is in many respects a decided improvement on the former volumes of the series, prepared by Mr. Binney for the Smithsonian Institution. The descriptions are full and accurate, and the wood-cut illustrations, numbering over 500, are entitled to the strongest commendation. The gravest objection which can be urged against the book is that Mr. Binney's well-known (and in many cases commendable) conservatism having induced him to place in the synonymy of the older species many of those recently described, instead of quoting in such cases the descriptions, and giving figures of such supposed synonyms, as in his former works, he has omitted both, thus compelling most of his readers to accept his decisions as final, because no opportunity is afforded for the exercise of individual judgment. I must also protest against the practice of many authors to write specific names, complimentary to individuals, with small initial letters, when those who gave the names used capitals: thus I object to being quoted for *Succinea greerii*, because I wrote it *Greerii*. If Mr. Binney thinks the use of the small initial

more correct and more elegant, let him use it by all means, and however his readers may be shocked upon reading, for instance, *Suc. haydeni*, W. G. B., they will not hesitate to concede his right to print it so if he pleases. But I submit that an author has no more right to alter the fashion of my specific name to suit his own taste than he has to dictate to me the style or fashion of coat that I shall wear. There is no "law" or "rule" on this subject to sanction Mr. Binney's proceeding. Such a "rule" was promulgated some years since, but found so few adherents that it has always been an *exception*; and the last Committee of the British Association very wisely and graciously granted to authors the privilege of doing as they please in the matter—for which we ought to be grateful. I now give warning to Mr. Binney, as well as all others, that I will not recognize any specific names thus altered, and I emphatically deny that I ever described such a species as the one I have quoted from Mr. Binney for illustration. That species can only be quoted as *Suc. greerii*, W. G. Binney.

It is unnecessary to criticise at length the genera, species and synonymy of Mr. Binney's work, because my views are fully expressed in my "Monograph of the Terrestrial Mollusca of the United States," published in the American Journal of Conchology, and also separately.

Mr. Binney is in error in quoting *Helix Cronkheitei* as a synonym of *striatella*, "from the description alone." Such a course is dangerous at all times, and doubly so when the species are so minute. The former is *very* different.

The figures of *Helix reticulata* and *H. Bridgesii*, intended by the author to prove that those two species are identical, will scarcely convince any one that such is the fact.

The shell figured by Mr. Binney as *Helix Carpenteri*, Newcomb, appears to be a fair representation of that species, but it is not specifically the same as my *Helix Remondi*. Dr. Newcomb admits the two to be distinct. The shells collected by Prof. Gabb, in Lower California, are *H. Remondi*, and not *Carpenteri*.

To the description of *Bulimulus pilula* should have been added that the periphery is sometimes encircled by a brown band.

A very valuable feature in Mr. Binney's work is the large number of figures of jaws and lingual dentition, those of nearly all the species being original to this work. The study of dentition has at length so far advanced as to cause many, even of those who at first supposed it would furnish us with an infallible classification, to waver in their faith. I never had much faith in

it, and Mr. Binney's figures assist my conviction that, as a basis of classification, it is utterly unreliable.

The book is a very valuable contribution to the study of American Conchology, and cannot fail to enjoy a wide circulation and enviable reputation among students. No working naturalist can conveniently dispense with it, and I particularly commend it to those who possess my own work on the same subject, in order that they may become acquainted with the views of a gentleman who has made the study of our terrestrial species a specialty, and whose decisions, differing in so many cases from my own, are, at least, entitled to the most careful consideration.

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**List of the Shell-Bearing Mollusca of Michigan, especially of Kent and adjoining Counties.** By A. O. CURRIER, Grand Rapids, Mich., 1868.

The locality furnishing the collections catalogued above is one of the most prolific in the United States in specific forms of terrestrial and fluviatile Mollusca, and, accordingly, we find that our correspondent has been able to make a list numbering nearly two hundred species.

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**American Journal of Science and Arts.** March, 1869.

*Are Unios sensible to light?* By C. A. WHITE.

Same Journal. May, 1869.

*Are Unios sensible to light?* By ISAAC LEA.

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**American Naturalist.** Vol. iii., No. 5. July, 1869. Salem, Mass.

*Notes on the Argonaut.* By W. H. DALL.

*The Haliotis, or Pearly Ear-Shell.* By R. E. C. STEARNS.

*A Chapter on Cuttle Fishes.* By LUCIE L. HARTT.

*Shell-Dredging.* By EDWARD S. MORSE.

This is decidedly a jubilee number of the *Naturalist* to those of its readers having conchological tastes. The three last papers are well illustrated.

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**First Annual Report of the Trustees of the Peabody Academy of Science.** Salem, Mass., 1869.

*Report on the Mollusca.* By E. S. MORSE, Curator.

*Actinobolus Novanglicæ,* Morse. Massachusetts.

## II.—FOREIGN.

### BRITISH.

**Report of the Thirty-fifth Meeting of the British Association for the Advancement of Science.** Held at Birmingham, in September, 1865. London, 1866.

*Report on Dredging among the Channel Islands.* By J. GWYN JEFFREYS.

Accompanying this paper is a list of eighty-one species of Mollusca found in the Channel Isles, but not extending northward to Shetland, and of fourteen species whose northern limit seems to be these islands.

*Report on the Cultivation of Oysters by Natural and Artificial Methods.* By FRANK BUCKLAND.

*Report of the Committee appointed to explore the Marine Fauna and Flora of the South Coast of Devon and Cornwall.* No. 1.

*Report on Dredging the Coast of Aberdeenshire.* By Rev. WALTER GREGOR and ROBERT DAWSON.

*On the scope of Conchological Inquiries; on the Classification of the Mollusca; on the Zoological Affinities of the Mollusca.* By O. A. L. MÖRCH.

**Report of the Thirty-sixth Meeting of the British Association for the Advancement of Science.** Nottingham Meeting, (1866.)

*Report on Dredging among the Hebrides.* By J. GWYN JEFFREYS.

*Montacuta tumidula*, Jeffreys, nov. sp.

*Notices of some Invertebrata, in connection with the Report of Mr. J. Gwyn Jeffreys on Dredging among the Hebrides.* By JOSHUA ALDER.

*On Oyster cultivation.* By F. BUCKLAND.

**Report of the Thirty-seventh Meeting of the British Association for the Advancement of Science.** Dundee, (1867.)

*Report of the Committee appointed to explore the Marine Fauna and Flora of the South Coast of Devon and Cornwall.* No. 2.

*Fourth Report on Dredging among the Shetland Isles.*  
By J. GWYN JEFFREYS.

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**Dr. James C. Cox's Exchange List of Land and Marine Shells from Australia and the adjacent Islands.** 81 pp., 12 mo. Sydney, N. S. W. 1868.

This extensive and useful catalogue contains—

1. *Species of Marine Mollusca found in Port Jackson Harbor, N. S. W., etc.*
  2. *List of Land and Fresh Water Shells of New Caledonia.*
  3. *List of Land Shells from the South Sea Islands.*
  4. *Species of Auriculacea found on the Australian Coasts and South Sea Islands.*
  5. *List of Land Shells of New Zealand.*
  6. *List of Australian Land Shells.*
  7. *List of Australian Volutide.*
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**Annals and Magazine of Natural History.** 4th Series. Vol. ii, No. 12. London, December, 1868.

*Description of Fairbankia bombayana, a new genus and species of Rissoide, from Western India.* By WM. T. BLANFORD.

*On the Habits of the Volutes.* By DR. R. O. CUNNINGHAM.

“In the April number of the ‘Annals and Magazine of Natural History,’ which I received not long since, I find at p. 310 a note by you on the habits of Volutes, in which you remark that they are rarely collected with their animals, except when they are accidentally thrown ashore after a storm, and that this is owing to their sand-burrowing propensities. This I have found to be the case as regards the species of the genus inhabiting the Strait of Magellan. During the first season I spent in that region, I only succeeded in obtaining two live specimens of *Voluta magellanica*, till the occurrence of a violent easterly gale caused numbers to be thrown on the beach in the neighborhood of the Chilian settlement at Punta Arena. That they only existed in comparatively shallow water I considered sufficiently proved by the fact that I never succeeded in dredging any, though they were evidently far from rare, judging from the numbers of dead shells to be picked up in most localities in the eastern part of the Strait. I obtained a second species of Volute, of which there is no specimen in the collection of Magellanic shells in the Museum at Santiago, at low water at Cape Posses-

sion in January, 1867. I found it burrowing in considerable numbers in the fine sand of the beach; and a few occurred upon clusters of live *Mytili* attached to stones, and, I believe, were feeding on them after the fashion of our *Purpura lapillus*, though I could not be certain of the fact. The body of the animal in this species, which was of a most beautiful color, was always very much extended from the shell, and the foot was of enormous size. The animal of *Voluta magellanica* is also purple, but of a much paler tint than that of the other volute. I regret I was unable to make drawings of the animals while alive; but numerous specimens of both species were included in the collection of marine animals in spirit which I sent to the British Museum last year."

*A mature Shell of Cypræa fusco-dentata, Gray.* By F. P. MARRAT.

"Mr. R. Keen, of Edge Lane, Liverpool, has recently procured a very interesting series of this shell, numbering nine or ten varieties; they fully exhibit the different stages of growth, from the earlier states to the finely colored adult individual. The question formerly advanced, of this being a ribbed species resembling *Cypræa Capensis*, Gray, is now completely and definitely settled. All the specimens hitherto obtained of this rare shell have been either young or decorticated; and it would appear that the species is extremely rare in a perfect state. This series includes the first and only example known to be so.

"The shell is a very fine one, measuring  $1\frac{1}{10}$  inch, with the teeth fully developed. The color is dirty drab, similar to the shells usually figured; but the back is covered with rufous-brown close spots like those on *Cyp. erronea*, Linn., and nearly as glossy, but has them larger, more confluent, and more suffused. The slightly raised ribs, usually seen in young examples, are not entirely obliterated by having the extra coat of enamel deposited over them."

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*On Capillary Vascular Systems in the Gasteropoda.* By PROF. C. WEDL.

Fourth Series. Vol. iii, No. 14. February, 1869.

*On the Homologies of the Dental Plates and Teeth of Probosciferous Gasteropoda.* By J. D. McDONALD, M. D.

No. 15. March, 1869.

*On the Animal and Operculum of Georissa, and on its relations to Hydrocena; with a Note on Hydrocena*



*tersa*, Bens., and *H. milium*, Bens. By WM. T. BLANFORD.

*On the Species of Veneridæ found in Japan.* By ARTHUR ADAMS.

*Dosinia gibba*, A. Ad.

I do not believe that *Gemma gemma*, Totten, is found in Japan. Mr. Adams has probably mistaken an undescribed allied species for it.

*Nudibranchs in Fresh Water.* By J. E. GRAY.

Mr. Kent described, at the last meeting of the Zoological Society, a new *Nudibranch* under the name of *Embletonia Grayii*, discovered in the Victoria Docks at Rotherhithe. When I mentioned the circumstance to Dr. Möbius, at Kiel, he observed:

"It was very interesting to me to find that a mollusk of the family *Eolimidæ* had been discovered in brackish water near London Bridge. In the Baltic Sea, *Embletonia pallida* extends as far as East Prussia, near Königsberg, where the water has only 7 of salt in 1000. In like manner, *Protolimax capitatus* (= *Limapontia nigra*) endures almost fresh water at Bornholm and Gothland, in the Baltic."

Mr. Kent informs me that *Embletonia Grayii* is nearly allied to *E. pallida*, and it has been found in company with *Daphnia*, *Florescularia*, and many other fresh water *Entomostraca* and *Rotifera*.

No. 16. April, 1869.

*Lamarck's Collection of Shells (Notice of).* By DR. J. E. GRAY.

No. 17. May, 1869.

*Notes on some Indian and Mascarene Land-Shells.* By WM. T. BLANFORD.

1. *On the Lingual Ribbon of Realia (Omphalotropis).*
2. *On Cyclotopsis.*
3. *On the Genus Cremnoconchus (olim Cremnobates).*
4. *On the Alyceine and Diplommatinine.*

*Notes on some recent Mediterranean species of Brachipoda.* By THOMAS DAVIDSON.

In this paper Risso's species are determined from the examination of the types in his collection. Prof. O. G. Costa's genus *Platidia* has three months priority over *Morrisia*, Davidson.

*Are Unios Sensitive to Light?* By C. A. WHITE. (From Silliman's Journal.)

**British Conchology, or an Account of the Mollusca which now inhabit the British Isles and the surrounding seas.** By J. GWYN JEFFREYS. Vol. iv. Marine Shells, in continuation of the Gasteropoda (from Rissoa) as far as the Bulla family. 8 vo. 490 pp. 9 pl. London, 1867.

This latest and *best* of the British Conchological manuals is drawing to its conclusion; another volume (5th) will complete it and furnish the colored illustrations of all the species described. Like Weinkauff's Mollusca of the Mediterranean Sea, and Brot's *Melanidae*, Mr. Jeffreys' work is a monument of the learning, accuracy, and exhaustive research distinguishing the best of the present generation of conchologists. The work is, of course, indispensable to all public and private libraries.

*Aporrhais Macandreeæ*, Jeffreys, is proposed instead of *A. pes-carbonis*, F. & H., the species being different from the fossil species described under the latter name by Brongniart.

*Cerithiopsis Barleei*, n. sp.

*Buccinopsis*, n. gen. Type *Buccinum Dalei*, J. Sowerby.

*Nassa nitida*, Jeffreys, n. sp.

*Columbella Haliceti*, n. sp.

*Utriculus ventrosus* is proposed in place of *U. globosa*, the latter name being preoccupied by Loven.

*Philine angulata*, Jeffreys, n. sp.

“ *nitida*, “ “

**British Conchology, or an Account of the Mollusca which now inhabit the British Isles and the surrounding seas.** Vol. v. Marine Shells, Supplement and Plates. By JOHN GWYN JEFFREYS. 12mo. 360 pp. and 103 lithographic plates. London, 1869.

It is impossible to do justice to the merits of this great work within the time and limits at my disposal. Never before has the molluscan fauna of any country been treated so learnedly and so thoroughly, and yet one knows not which most to admire, the vast knowledge displayed in its pages or the simple, unobtrusive manner in which it is conveyed in words suitable to the thorough comprehension of all classes of readers. I cannot even take the time to advert to many changes of nomenclature of genera and species here adopted. I may mention, however, that Mr. Jeffreys adopts the *Auricula bidentata* of Montagu into the genus *Melampus*, and thus preoccupies Say's name for the American species, which, he says, must receive the name given to it by Deshayes in 1830—*M. corneus*; but the fact is, that the two species do not belong to the same genus.

*Odostomia Warreni*, Thompson, previously quoted as a variety of *O. obliqua*, is now described as a new species.

The illustrations of all the species by Sowerby are generally very life-like, although not finely executed.

There is no doubt that the publication of this work will be as great a success pecuniarily to its liberal publishers as it is scientifically to its author.

**A Manual of the Mollusca: A Treatise of Recent and Fossil Shells.** By DR. S. P. WOODWARD. Second edition. With an appendix of Recent and Fossil Conchological Discoveries to the Present Time. By RALPH TATE. 12mo. 518 pp. and 85 pp., and 24 plates. London, 1868.

A new edition of this, the most valuable of the smaller works on the classification of shells, was much wanted, and Mr. Tate has supplied the want in a manner that, on the whole, may be considered satisfactory. It is, perhaps, expecting too much to ask for entire accuracy in a work of this character, and, accordingly, we find some errors in the arrangement of the genera, occurring in the United States and its coasts. It is scarcely worth while to particularize these errors and omissions, however, as they are not of great importance. The work has been carefully prepared, and gives evidence of a large acquaintance with the subject. It will receive a warm welcome from conchological students.

**Conchologia Iconica.** By G. B. SOWERBY. Parts 278, 279. London, April, 1869.

*Tellina*, plates 55—58, concluding the Monograph, which embraces 345 species, many of which are, however, only nominal.

- T. Brazieri*, Sowb. Port Jackson.
- " *Shanghaiensis*, Sowb. Shanghai.
- " *compressissima*, " Japan.
- " *crasseplicata*, " Sandwich Isles.
- " *semi-inflata*, " Loc. ?
- " *semiaspera*, Deshayes. Australia ?
- " *parva*, Sowb. Loc. ?
- " *politissima*, Sowb. Loc. ?
- " *amphidesmoides*, Sowb. Loc. ?
- " *lenticularis*, Sowb. Japan.

*Atys*. 5 plates, complete.

- A. amygdala*, Sowb. Loc. ?
- " *Guikdingii*, " St. Vincents.
- " *attenuata*, " Loc. ?
- " *porcellana*, Guilding. Hab. "Kagosima, Western States." We have not yet annexed Japan.

*Hyria*. 5 plates, complete.

*H. exasperata*, Sowb. British Guayana.

" *latialata*, " " "

" *rugosissima*, " Amazon.

These are all synonymous with the well-known *H. corrugata*.

*H. recta*, Sowerby. Hab.—?

" *alata*, " Guayana.

These are both synonymous with *H. avicularis*.

*Castalia*, 3 plates, complete.

*C. Schombergiana*, Sowb. Guayana.

" *Hanleyana*, Sowb. Hab.—?

" *Carolinensis*, Sowb. "South Carolina. But for the localities, this little shell might be thought a young specimen of *Castalia retusa*." I can assure Mr. Sowerby that if his species was ever in South Carolina it was sent or brought there from the Amazon; it is nothing but an *ambigua*.

*C. quadrata*, Sowerby. Hab.—?

" *cordata*, Humphrey, MSS. Guayana.

" *dolabella*, Sowb. Hab.—?

Of all these so-called new species the first and last only are in my opinion distinct.

**Proceedings of the Zoological Society.** Part 3. London, 1868.

*On Pelagic Shells, collected during a voyage from Vancouver's Island to this country.* By Commander HUGH H. KNOCKER.

*Ianthina nitida*, A. Ad.

This paper contains tables of latitude and longitude at which the various species were collected.

#### ERRATUM.

In noticing the 2d part of Zool. Proc. for 1868, by one of those errors which are more readily committed than accounted for, I made Mr. Ponton to decide that *Cymba patula*, Brod., is the young of *C. Neptuni*, whereas he stated the former to be distinct.

## FRENCH.

**Catalogue des Mollusques Testaces des Mers d'Europe.** By M. PETIT DE LA SAUSSAYE. 8 vo., 312, pp. Paris, 1869.

This is an exceedingly valuable volume, and its author has performed a good work in preparing and publishing it, for which he will receive the thanks of his brother Conchologists not only of Europe but throughout the world. Its principal contents are:

1. Complete list of authors cited.
2. Classification of Families and Genera.
3. Systematic Catalogue. This part of the book occupies 150 pages, and contains a list of 1150 species, with the synonyms carefully worked out. The print is large, so that the names can be cut out and used as labels if deemed desirable. The attachment of numbers to the names I think would also have been desirable, as it would have enabled those who prefer it to label their collections with corresponding numbers only.
4. Geographical Distribution, tabulated into Polar, Boreal, British, Celtic, Lusitanian, Mediterranean and Algerian Zones and Special Localities.
5. Notice of the exotic species cited as living in the Seas of Europe.
6. Explanatory and critical notices of many of the European Species.
7. Instruction to collectors of shells.
8. Republication of the Diagnoses of Shells published by Requier in his Catalogue of the shells of Corsica.

**Mollusques nouveaux, litigieux ou peu connus.** By M. J. R. BOURGUIGNAT. 10th liv. Paris, 1868. With 4 plates.

We have already noticed the species herein contained, in reviewing the "Revue et Magasin de Zoologie," where they were first published.

**Catalogue of the Shells and Crustaceans of Guadeloupe,** sent to the Universal Exposition of 1867 by the Administration of the Colony. Determined by M. A. SCHRAMM. 2d edition. 27 pp. 8 vo. Basse-Terre, 1869.

This catalogue of Mollusks is very complete, extending to 781 numbers.

**Revue et Magasin de Zoologie.** 1869. Nos. 2—5. 8vo. Paris.

*Catalogue des Mollusques terrestres et fluviatiles recueillis dans le département de la Vendée, etc.* By M. LETOURNEUX.

*Geomalacus Vendeanus,*                      *Helix Vendeanus.*  
*Valvata Bourguignati.*

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**Essai sur la Faune Malacologique de Belgique, ou Catalogue des Mollusques qui trouvent dans ce pays.** By F. DE MALZINE. Brussels, 1869. 8vo, 98 pp. 3 col'd plates.

This work includes the enumeration of the land, fresh-water and marine species of Belgium, with their synonymy. The following are described as new:

<i>Pisidium minimum,</i>	<i>Helix Villersii,</i>
<i>Unio Lambottei,</i>	<i>Limnæa pseudostagnatis,</i>
<i>Unio Ryckholtii,</i>	“ <i>linearis,</i>
<i>Unio Robianoï,</i>	<i>Cardium Belgicum,</i>
<i>Succinea Colbeauiana,</i>	<i>Limax niger.</i>

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**Journal de Conchyliologie.** 3d Ser. IX, No. 3, July, 1869. Paris. 112 pp. and 4 plates.

*Anatomie de l'Anostome.* By DR. P. FISCHER.

*Note sur le ruban lingual du Gonospira palanga,* Lesson.  
By H. CROSSE and P. FISCHER.

*Gonospira*, N. G., type *Pupa palanga*.

*Sur la Famille des Cardiadæ.* By THOMAS GRAHAM PONTON.

With list of species arranged under the modern genera.

*Note sur le Mitra Desetangsii,* Kiener. By E. LIENARD.

*Description d'un Dolium Méditerranéen nouveau.* By T. ALLERY DE MONTEROSATO.

*Gastéropodes nouveaux de l'Adriatique.* By SPIRIDIONE BRUSINA.

<i>Nassa encaustica,</i>	<i>Eulima Stalioli,</i>
<i>Mangelia Stosiciana,</i>	“ <i>Petitiana,</i>
<i>Odostomia intermedia,</i>	“ <i>microstoma,</i>
“ <i>turbonilloides,</i>	<i>Leiostraca Jeffreysiana,</i>
“ <i>monozona,</i>	<i>Scalaria Kuzmici,</i>
“ <i>Nardoi,</i>	<i>Setia ochroleuca,</i>
“ <i>Erjavceiana,</i>	<i>Brochina Chierghiniana.</i>



*Diagnoses Molluscorum novorum reipublica Mexicana et Americæ centralis.* By H. CROSSE and P. FISCHER.

*Glandina guttata,* *Helicina Bocourti.*

*Description de plusieurs Hélices inédites, de France et d'Espagne, suivie d'observations et de rectifications concernant deux autres especes.* By P. RAMBUR, M. D.

These species were all described in the *Journal de Conch.* 1868.

*Diagnose d'un Bulime inédit de la Nouvelle Calédonie.* By H. CROSSE and DR. SOUVERBIE.

*Bul. Bondeensis.*

*Diagnoses Molluscorum Novæ Caledoniæ incolarum.* By DR. SOUVERBIE.

*Bulimus submariei,* *Bul. Mariei,* Crosse.

*Description d'espèces nouvelles de la Méditerranée.* By T. ALLERY DE MONTEROSATO.

*Homalogyra Fischeriana,* *Cerithium Benoitianum.*  
*Helix Doderleiniana.*

*Diagnose d'une espèce nouvelle de Voluta.* By H. CROSSE.

*Voluta Hamillei,* Solomon's Islands.

*Description d'espèces inédites provenant de la Nouvelle Calédonie.* By H. CROSSE.

*Turbinella Mariei,* *Melanopsis Mariei.*

*Melanopsis Dumbeensis.*

*Description de Coquilles fossiles des terrains tertiaires supérieurs (continued).* By C. MAYER.

*Description de Coquilles fossiles des terrains tertiaires inférieurs (continued).* By C. MAYER.

*Bibliographie.* By H. CROSSE.

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GERMAN.

**Malakozoologische Blätter.** Conducted by DR. LOUIS PFEIFFER. Vol. 14. 240 pp. 3 plates. Cassel, 1867.

*Ueber die neueren systematischen Anordnungen der Heliceen.* By DR. L. PFEIFFER.

*Ueberblick der Najaden des Indischen Archipels.* By DR. EDW. VON MARTENS.

*Anodonta exilis*, Lea. *A. polita*, Mouss., and *A. siliqua*, Küster, are made synonyms.

*A. purpurca*, Val. *A. Burroughiana*, *subcrassa*, *tenuis*, *crepera*, and *gracilis*, and *Unio Bengalensis*, Lea, and *Unio verecundus*, Gould, are made synonyms. I do not agree to this wholesale synonymy, by any means. The author thinks it not unlikely that *U. Bengalensis* is from the Philippine Islands rather than from Bengal, but I can assure him that the specimens in our collections are from Bengal.

*Pseudodon Vondembuschiana*, Lea, *A. Zollingeri*, Mousson, and *Monocond. Cumingi*, Lea, are considered synonyms.

*Pseud. crispata*, Mousson, *Monocond. planulata*, Lea, and *M. fragilis*, Küster, are made synonyms.

*U. superbus*, Lea. *U. macropterus*, Dunker, is made a synonym.

*U. caudiculatus*, nov. sp. Borneo.

*U. cucumoides*, Lea. *U. Cumingianus*, Dunker (non Lea), is a synonym.

*Ueber einige Muscheln des oberen Nilgebietes.* By DR. ED. VON MARTENS.

*Unio Abyssinicus*, Martens. Abyssinia.

*Unio tricolor*, Küster? “

*Kritische Uebersicht aller Arten der zur Gattung Venus gehörenden Untergattung Cryptogramma.* By DR. EDW. RÖMER.

*Kritische Uebersicht aller zum sub-genus Chione gehorenden Arten von Venus.* By DR. EDW. RÖMER.

Two valuable papers, in which the species are carefully studied, the synonymy worked out and diagnoses corrected.

*Neuer Bulimus.* By E. VON MARTENS.

*B. involutus*, Martens. Brazil.

*Eine neue Helix.* By DR. LOUIS PFEIFFER.

*H. revoluta*, Pfr. Andaman Islands.

*Descriptio brevis molluscorum quorundam terrestrium, a clarissimo viro Antonio Raimondii Peruvia lectorum.* By R. A. PHILIPPI, with appendix by DR. LOUIS PFEIFFER.

<i>Helix Raimondi</i> ,	<i>Bulimus ignobilis</i> ,
“ <i>Huanucensis</i> ,	“ <i>Chenui</i> ,
“ <i>pellis-colubri</i> ,	“ <i>Trugillensis</i> ,
“ <i>Tschudiana</i> ,	“ <i>delicatululus</i> ,
“ <i>alsophila</i> ,	“ <i>miliaris</i> ,
<i>Bulimus crenellus</i> ,	“ <i>stigmaticus</i> ,
“ <i>cygneus</i> ,	“ <i>Iserni</i> ,
“ <i>eurystomus</i> ,	<i>Pupa Limensis</i> ,
“ <i>hamadryas</i> ,	<i>Bulimus Canarius</i> ,
“ <i>auris-ratti</i> ,	“ <i>peliosomus</i> ,
“ <i>alsophilus</i> ,	“ <i>productus</i> ,
“ <i>morbilus</i> ,	“ <i>scalarioides</i> ,
“ <i>tarmensis</i> ,	“ <i>nemorensis</i> ,
“ <i>Troscheli</i> ,	<i>Balea Peruviana</i> ,
“ <i>tapadoides</i> ,	<i>Succinea Peruviana</i> ,
“ <i>serena</i> ,	<i>Helix Cuyana</i> , Strobel.

*H. Andium* for *H. Andicola*, Phil., non Pfeiffer.

*H. Minviellei* for *H. Pazi*, preoccupied by Poey.

*Diagnosen neuer Heliceen.* By DR. L. PFEIFFER.

<i>Helix Milleri</i> , Pfr.	Bahamas.
“ <i>Salvatoris</i> , Pfr.	“
“ <i>subacuta</i> , Pfr.	Jamaica.
“ <i>Julia</i> , Fer. ( <i>desc. emend.</i> )	“
<i>Pupa Milleri</i> , Pfr.	Bahamas.
“ <i>Bryanti</i> , Pfr.	“
<i>Ctenopoma Bryanti</i> , Pfr.	“

*Limax variegatus*, *Kosmopolitisch*. Notice by F. D. HEYNEMANN.

*Ueber einige Landschnecken des oberen Amazonen-strom-gebiets.* By EDW. VON MARTENS.

*Bulimus (Borus) accelerans.* *Bul. (Drymaeus) interpictus.*  
*Bulimulus chrysomelas.*

*Die Zungen von Partula und Achatinella.* By F. D. HEYNEMANN.

*Ein neues Cyclostoma von Cuba.* By DR. L. PFEIFFER.  
*Choanopoma Humboldtianum.*

*Literatur.* By DR. E. VON MARTENS.

*Drei neue West Indische Pneumonopomen.* By DR. L. PFEIFFER.

*Helicina Rawsoni*, Ins. Inagua. *Chondropoma Rawsoni*, Ins.  
“ *Bryanti*, Ins. Inagua. Inagua.

*Einige Japanesische Konchylien aus der Bucht von Jedo.*  
By C. E. LISCHKE.

Remarks are made upon fifty-five species, of which some are undetermined, but none are described as new.

*Necrology*:—*Rossmüssler*. By ADOLF SCHMIDT.

*Oopelta, Mörch, neue Nacktschnecken gattung.* By F. D. HEYNEMANN.

*Oopelta nigropunctata*, Mörch. Guinea.

*Beschreibung zweier neuen Peruanischen Clausilien.* By DR. R. A. PHILIPPI.

*Cl. malleolata.* *Cl. Raimondii.*

*Neue Heliceen.* By DR. L. PFEIFFER.

*Helix elegantula.* Mexico. *Bul. Landaueri.*

" *subhyalina.* " *Oleacina incisa.*

" *Henschei.* New Caledonia. *Tornatellina Blandiana.*

" *scollaris.* Hab.—?

*Beschreibungen und Kritik neuer Mollusken.* By DR. C. AGARDH WESTERLUND.

*Vertigo tumida.* Pehrshorg, near Ronneby, Sweden.

*Planorbis limophilus.* " " " "

*Zwei neue Süßwasser-Muscheln aus Afrika.* By W. DUNKER.

*Galatea truncata.* Guinea. *Fischeria curta.* Guinea.

*Zur Molluskenfauna von Cuba.* By DR. L. PFEIFFER.  
(Continued.)

*Cylindrella macra*, Wright. *Chondropoma cirratum*, Wright.

*Ueber die Ost-Asiatischen Limnæaceen.* By E. VON MARTENS.

*Planorbis infralineatus.* Java. *Planorbis calathus*, Benson. Japan.

" *aberrans.* China. *Physa Philippina.* Luzon.

" *Largillierti.* " *Limnæus pervius.* China.

*Malakozoologische Blätter.* Vol. xv, 226 pp. 8vo. 5 pl. Cassel, 1868.

*Versuch einer Geschichte der conchyliologischen Nomenclatur.* By O. A. L. MÖRCH.

*Die Nacktschnecken von der Prinzeninsel.* By F. D. HEYNEMANN.

*Dendrolimax*, N. Gen.      *G. Heynemanni*, Dohrn.  
*Veronicella myrmecophila*.

*Literatur.* By L. PFEIFFER.

*Diagnosen einiger noch unbeschriebenen Heliceen.* By  
 DR. L. PFEIFFER.

*Helix Gobanzi*, Frauenfeld. Tirol.

*Clausilia tichobates*, Parreyss. Dalmatia.

“ *Gobanzi*, “ Styria.

*System der Europäischen Clausilien und ihrer nächsten  
 Verwandten.* By ADOLF SCHMIDT.

*Zur Anatomie von Trigonia margaritacea*, Lam. By DR.  
 EMIL SELENKA.

*Ueber einige Schnecken der Abruzzan.* By DR. EDW.  
 VON MARTENS.

*Diagnosen neuer Heliceen.* By DR. L. PFEIFFER.

*Helix crypta*, Parreyss. Dalmatia.

“ *Chamæleon*, “ Cavinthia.

*Spiraxis tenuis*, Pfr. Mexico.

*Bemerkungen über einige Arten von Cardium.* By DR.  
 E. RÖMER.

*Die Mundtheile einige Brazilianischen Land und Süßwas-  
 serschnecken.* By F. D. HEYNEMANN.

*Studien über die Familie der Veneraceen oder Venus-  
 muscheln.* By DR. L. PFEIFFER.

*Zwei neue Landschnecken aus Costarica.* By DR. E. VON  
 MARTENS.

*Helix triplicata.*      *Bulimulus rhodotrema*.

*Ueber einige Heliceen vom Himalaya.* By DR. E. VON  
 MARTENS.

*Helix elatior.*      *Helix pettos.*

*Ueber drei Philippinische Cochlostylen.* By E. VON  
 MARTENS.

*Cochlos. chloroleuca*, nov. spec.

*Aufruf an die Malakologen Deutschlands. Ueber süd-  
 brasilische Land-und Süßwasser Mollusken.* By EDW.  
 VON MARTENS.

*Bulimus tudiculatus*,

*Bulimulus Henselii*,

*Streptaxis apertus*,

*Succinea convexa*,

*Chilina pava*,

*Planorbis purus*.

*Diagnosen neuer Meeres-Konchylien von Japan.* By DR. C. E. LISCHKE.

<i>Fusus inconstans,</i>	<i>Acmaea Schrenckii,</i>
<i>Murex Troscheli,</i>	<i>Mytilus crassitesta,</i>
<i>Triton Dunkeri,</i>	<i>Spondylus cruentus,</i>
	<i>Nassa Japonica.</i>

*Conchylia nova potissimum Magellanica.* By DR. R. A. PHILIPPI.

<i>Buccinum Antarcticum,</i>	<i>Modiola Antarctica,</i>
" <i>Actonis,</i>	<i>Patella ? emarginuloides,</i>
<i>Columbella ebumum,</i>	<i>Rissoa Schythei,</i>
<i>Daphnella magellanica,</i>	<i>Trophon antarcticus,</i>
<i>Fusus univarinatus,</i>	<i>Venus Australis,</i>
	<i>Hydrobia Antarctica.</i>

**Monographia Heliceorum viventium.** Vol. sextum. Auct. Ludovico Pfeiffer, Dr. 8vo. 598 pp. Leipzig, 1868.

This is the second volume of the third supplement to the monograph of *Helicidae*:—The first, noticed by me recently, contained *Helix* proper, while the present issue is devoted to *Bulinus*, *Achatina*, *Pupa*, *Cylindrella*, *Clausilia*, etc.

The last issue of the monograph of these genera was in 1859, and I give below the number of species contained in each genus, both of that and the present volume, in order to exhibit the prodigious advance of our knowledge of these genera during ten years.

No. of species of *Bulinus*, *Achatina*, *Pupa*, *Cylindrella*, *Clausilia*.

1859,	1490,	334,	239,	164,	395, = 2622.
1868,	1782,	453,	326,	274,	585, = 3420.

**Novitates Conchologicæ.** Land-Conchylien. Part 33. By DR. LOUIS PFEIFFER. 4to. 3 col. plates. Cassel.

The figures illustrate *Cylindrella* 1 plate, *Cyclostomidae* 1 plate, and a plate of *Helix* and *Achatina*.

**Part 34.** 4to, 3 colored plates.

Illustrates *Cylindrellidae*, *Helix* and *Bulinus*.

**Part 35.** 4to, 3 colored plates.

The plates illustrate sixteen species of *Unionidae* and two of *Corbiculadæ*, from Chili, described by Philippi in the *Malakozoologische Blätter*, 1869.



**Novitates Conchologicæ.** Supplement III. Monographie der Mollusken gattung Venus. By DR. EDW. RÖMER. 16-17 parts, 6 colored plates.

The present issue is a monography of the section *Crista*, Römer, of the sub-genus *Cytherea*.

*C. adunca*, Römer. Indian Ocean.

**Parts 18, 19.** With 6 colored plates.

The present issue is occupied with descriptions of the species of *Circe*.

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**Novitates Conchologicæ.** Mures-Conchylien. By DR. WM. DUNKER. Part 15, 4to, 3 colored plates.

*Fusus Meyeri*, Dunker, n. sp. Hab.—?

“ *Rudolphi*, “ n. sp. “

*Solen Lappeanis*, “ Carribean Sea.

*Solen Morchii*, Dunker, n. sp. Hab.—?

*Siliquaria centralis*, Conrad. Coast of Georgia.

The shell here figured is nothing but the *S. gibba*, Spengler, with which Dr. Dunker believes it to be “nearest allied.” Mr. Conrad never described a species under the name of *S. centralis*.

**Part 14.** 4to, 3 colored plates.

*Murex depresso-spinosus*, Dkr., n. sp. Loc. ?

The plates illustrate species of *Area* and *Murex*.

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**Systematisches Conchylien Cabinet von Martini und Chemnitz.** Continued by H. C. KÜSTER. Vol. 3, part 27, 4to. Nurnberg, 1869.

Contains continuation of monograph of *Murex*, with six colored plates.

**Vol. x, part 3d.**

Continues Römer's monograph of *Cardiidae* with six colored plates.

**Vol. xi, part 7th.**

Contains continuation of Römer's monograph of *Veneridae*, with six colored plates.

*Cyclina intumescens*, Römer, n. sp. Northern Europe.

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**Systematisches Conchylien-Cabinet von Martini und Chemnitz.** Conducted by H. C. KÜSTER. 191st part. Nurnberg, 1869.

This part contains the continuation of the monographs of the *Veneridae* and of *Cardium*, and has a colored plate.

*Cardium glabratum*, Römer, is proposed instead of *C. lævigatum*, Reeve, non Linn.



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# CATALOGUES

OF THE

## FAMILIES

### PORCELLANIDÆ AND AMPHIPERASIDÆ.

By S. R. ROBERTS.

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It has been the aim of the writer, in the compilation of these Catalogues, as far as possible to recognize the services of old authors wherever they were *binomial*. This will meet with some opposition, especially from those who wish to adhere to the rules laid down by certain Associations, which ignore the claims of all Authors prior to Linnæus.

The families have been subdivided according to H. and A. Adams; although but little importance can be attached to some of these subdivisions; yet as they serve to lessen the labor in arranging the Catalogues, they are here adopted. Some difficulty has been experienced regarding dates of publication, especially where the monographs were published in parts. As an illustration, Kiener's Monograph was published in this manner, no dates being given to indicate when each part was issued. When these dates are known correctly, some of his species may have priority. Sowerby's Monograph in *Conch. Illus.* was completed in 1837, and that date has been taken for his species in some cases.

The writer here returns thanks to Messrs. John G. Anthony, G. W. Tryon, Jr., and others, who have aided him in compiling these Catalogues, and to Mr. John H. Redfield, who has made some valuable additions to the geographical distribution of the species.

#### MONOGRAPHS REFERRED TO:

- C. Ic. = Reeve's *Conchologia Iconica*.
- C. Ill. = Sowerby's *Conchological Illustrations*.
- Thes. = Sowerby's *Thesaurus Conchyliorum*.
- Coq. Viv. = Kiener's *Coquilles Vivantes*, &c.

Family **PORCELLANIDÆ.**Genus **PORCELLANA**, Rumph.

Amb. Rarit. p. 113, 1705.

Klein, Tent. Method. p. 83, 1753.

*Cypræa*, Linn., Syst. Nat. p. 1172, 1767.

- ✓ 1. **P. argus**, Rumph., Amb. Rarit. pl. 38, f. D, 1705.  
*C. argus*, Linn., Syst. Nat. p. 1173, (12th ed.) 1767. C. Ic. pl. 3, sp. 8. C. Ill. f. 25. Coq. Viv. p. 77, pl. 37, 38, f. 1.  
*Indian Ocean and Malayan Archipelago.*
- ✓ 2. **P. aselli**, Rumph., Amb. Rarit. pl. 39, f. M, 1705.  
*C. asellus*, Linn., Syst. Nat. p. 1178, 1767. C. Ic. pl. 18, sp. 98. C. Ill. sp. 61, f. 93, Coq. Viv. p. 93, pl. 31, f. 3.  
*Indian Ocean and Malayan Archipelago.*
- ✓ 3. **P. carneola**, Rumph., Amb. Rarit. pl. 38, f. K, 1705.  
*C. carneola*, Linn., Syst. Nat. p. 1174, 1767. C. Ic. pl. 6, f. 19. C. Ill. sp. 14, f. 165. Coq. Viv. p. 83, pl. 37, f. 3.  
*C. crassa*, Gmel., Syst. Nat. p. 3421, 1788.  
*C. Otaheitisensis*, Sch. et. Wag. p. 108, pl. 228, f. 4029-30, 1829. *Indian Ocean, Otaheite?*
- ✓ 4. **P. cervinetta**, Kien., Coq. Viv. p. 74, pl. 6, f. 1, 2, — ?  
*Mazatlan—Panama.*
- ✓ 5. **P. cervus**, Linn., Mantissa, p. 548, 1771.  
C. Ic. pl. 2, sp. 6. C. Ill. sp. 22, f. 175. Coq. Viv. p. 72, pl. 2, 3, f. 1.  
*C. oculata*, Gmel., Syst. Nat. p. 3403, 1790.  
*C. cervina*, Lam., An. sans Vert. vii, p. 375, 1822.  
*Panama, Pacific Ocean.*
6. **P. chrysalis**, Kien., Coq. Viv. p. 92, pl. 54, f. 4.  
*Hab.—?*
7. **P. clara**, Gask., Proc. Zool. Soc. p. 13, 1851. *Hab.—?*
8. **P. cribellum**, Gask., Proc. Zool. Soc. p. 22, 1849.  
*Mediterranean.*
9. **P. Crossei**, Marie, Jour. de Conch. xvii, p. 16, pl. 1, f. 3, 1869. *Nouméa.*
- ✓ 10. **P. cylindrica**, Born., Mus. p. 184, pl. 8, f. 10, 1780.  
C. Ic. pl. 14, sp. 64. C. Ill. sp. 74, f. 101. Coq. Viv. p. 89, pl. 16, f. 3. *Philippines.*
11. **P. Erythræensis**, Beck MSS. C. Ic. pl. 14, sp. 63, 1845.  
C. Ill. f. 161. *Zanzibar.*

- ✓ 12. **P. exanthema**, Linn., Syst. Nat. p. 1172, 1767.  
 C. Ic. pl. 5, sp. 16. C. Ill. sp. 21, f. 170. Coq. Viv. p. 71, pl. 4, 5, f. 1.  
*C. zebra*, Linn., Syst. Nat. p. 1174.  
*C. plumbea*, Gmel., Syst. Nat. p. 3403, 1790.  
*C. bifasciata*, Gmel., Syst. Nat. p. 3405.  
*C. dubia*, Gmel. Syst. Nat. p. 3405. *West Indies.*
13. **P. exusta**, Sowb., C. Ill. sp. 25, f. 2\*, 1837.  
 C. Ic. pl. 2, sp. 4. Coq. Viv. p. 81, pl. 13, f. 1. *Red Sea.*
- ✓ 14. **P. felina**, Gmel. (*non* Gray), Syst. Nat. p. 3412, 1790.  
 C. Ic. pl. 19, f. 105, b. C. Ill. f. 135, 137. Coq. Viv. p. 96, pl. 33, f. 3. *Indian Ocean.*
15. **P. fimbriata**, Gmel., Syst. Nat. p. 3420, 1790.  
 C. Ic. pl. 18, sp. 92. C. Ill. sp. 98, f. 138, 140. Coq. Viv. p. 98, pl. 51, f. 4. *Polynesia.*
16. **P. fuscomaculata**, Pse., Proc. Zool. Soc. p. 515, 1865.  
 Am. Jour. Conch. iv. pl. 11, f. 10, 11, 1868. *Central Pacific.*
17. **P. Helenæ**, Roberts, Am. Jour. Conch. iv, p. 250, pl. 15, f. 7-10, 1868. *Sandwich Islands?*
- ✓ 18. **P. hirundo**, Linn., Syst. Nat. p. 1178, 1767.  
 C. Ic. pl. 19, sp. 104. C. Ill. sp. 64, f. 174. Coq. Viv. p. 95, pl. 32, f. 1.  
*C. Owenii*, Sowb.\* (*non* Gray,) C. Ill. sp. 64, f. 12\*\*. *Indian Ocean.*
19. **P. interrupta**, Gray, Zool. Jour. i, p. 376, 1824.  
 C. Ic. pl. 19, sp. 103. C. Ill. sp. 63, f. 15. Coq. Viv. p. 94, pl. 43, f. 2. *Philippines.*
20. **P. irrorata**, Sol. MSS., Zool. Jour. iv, p. 80, 1828.  
 C. Ic. pl. 22, sp. 126. C. Ill. sp. 82, f. 25. Coq. Viv. p. 101, pl. 57, f. 4. *Elizabeth Island.*
- ✓ 21. **P. Isabella**, Rumph., Amb. Rarit. pl. 39, f. G, 1705.  
*C. Isabella*, Linn., Syst. Nat. p. 1177, 1767. C. Ic. pl. 12, sp. 51. C. Ill. sp. 29, f. 98. Coq. Viv. p. 87, pl. 48, f. 3.  
*C. controversa*, Gray, Zool. Jour. i, p. 144; iv, p. 71, 1824. *Indian Ocean, Sandwich Islands.*
- ✓ 22. **P. lurida**, Linn., Syst. Nat. p. 1175, 1767.  
 C. Ic. pl. 9, sp. 32. C. Ill. sp. 31, f. 82. Coq. Viv. p. 82, pl. 23, f. 1. *Mediterranean.*
- ✓ 23. **P. microdon**, Gray, Zool. Jour. iv, p. 71, 1828.  
 C. Ic. pl. 24, sp. 139. C. Ill. sp. 32, f. 3. Coq. Viv. p. 102, pl. 56, f. 5. *Philippines.*

\*This species was cancelled by the author, but as Dr. Jay has it noticed in his Catalogue, it is here inserted as a synonym.

24. **P. neglecta**,\* Sowb., C. Ill. sp. 66, f. 12,\* 1837.  
C. Ic. pl. 19, sp. 100. *Mauritius.*
25. **P. notata**, Gill, An. Lyc. N. H. vi, p. 255, pl. 9, f. 1—3,  
1858. *E. Indies.*
26. **P. parvula**, Philippi, Zeit. fur Malak, p. 24, 1849.  
*Hab.—?*
27. **P. pulchra**, Gray, Zool. Jour. i, p. 143, pl. 7 & 12, f. 9,  
1824.  
C. Ic. pl. 9, sp. 34. C. Ill. sp. 28, f. 126. Coq. Viv. p.  
85, pl. 15, f. 5. *Red Sea, Persian Gulf.*
28. **P. pulicaria**, Reeve, Proc. Zool. Soc. p. 23, 1846.  
Proc. Zool. Soc. p. 97, 1848. C. Ic. pl. 17, sp. 84.  
*Hab.—?*
- ✓ 29. **P. quadrimaculata**, Gray, Zool. Jour. i, p. 376, 1824.  
C. Ic. pl. 19, sp. 107. C. Ill. sp. 62, f. 88. Coq. Viv. p.  
90, pl. 3, f. 3.  
*C. pallidula*, Gask., var., Proc. Zool. Soc. p. 97, 1848.  
*East Indies.*
30. **P. rhinoceros**, Souv., Jour. de Conch. p. 156, pl. 5, f. 1,  
1865. *Caledonian Archipelago.*
- ✓ 31. **P. scurra**, Chem., Conch. Cab. x, p. 103, pl. 144, f. 1338,  
1788.  
C. Ic. pl. 11, sp. 45. C. Ill. sp. 27, f. 103, 106. Coq.  
Viv. p. 107, pl. 5, f. 2, pl. 50, f. 1.  
*C. Indica*, Gmel., Syst. Nat. p. 3412, 1790. *Indian Ocean.*
32. **P. stolidia**, Linn., Syst. Nat. p. 1180, 1767.  
C. Ic. pl. 14, sp. 67. C. Ill. sp. 65, f. 91, 92. Coq. Viv.  
p. 23, pl. 31, f. 1.  
*C. ferruginea*, Humph., Cab. Cat. No. 113.  
*C. rubiginosa*, Gmel., Syst. Nat. p. 3420, 1790. *Ceylon.*
33. **P. tabescens**, Sol., MSS. Dillw. Cat. i, p. 463, 1817.  
C. Ic. pl. 14, sp. 66. C. Ill. sp. 73, f. 14. Coq. Viv. p.  
88, pl. 5, f. 3. *Pacific O.*
- ✓ 34. **P. talpa**, Rumph., Amb. Rarit. pl. 38, f. i, 1705.  
Linn., Syst. Nat. p. 1174, 1767. C. Ic. pl. 2, sp. 5. C.  
Ill. sp. 24, f. 113. Coq. Viv. p. 79, pl. 12, f. 2.  
*Indian and Pacific Oceans.*
35. **P. teres**, Gmel., Syst. Nat. p. 3405, 1790.  
C. Ic. pl. 18, sp. 93. C. Ill. sp. 72, f. 56. Coq. Viv. p.  
91, pl. 39, f. 3. *Hab.—?*

\* Closely allied to *P. hirundo*, Linn.



- ✓ 36. **P. testudinaria**, Linn., Syst. Nat. p. 1173, 1767.  
 C. Ic. pl. 3, sp. 9. C. Ill. f. 152. Coq. Viv. p. 78, pl. 15, 16, f. 1.  
*C. testudinosa*, Perry, Conch. pl. 22, f. 7, 1811.  
*Indian Ocean.*
37. **P. unifasciata**,\* Mighels, Proc. Bost. Soc. ii, p. 24, 1848.  
*Oahu.*
- ✓ 38. **P. ursellus**, Gmel., Syst. Nat. p. 3411, 1790.  
 Coq. Viv. p. 99, pl. 33, f. 4. *Indian Ocean.*

Genus **LUPONIA**, Gray.

Desc. Cat. Cyp. 1832.

- ✓ 1. **L. albuginosa**, Mawe, Zool. Jour. i, p. 510, 1824.  
 C. Ic. pl. 18, sp. 94. C. Ill. sp. 45, f. 102. Coq. Viv. p. 49, pl. 32, f. 2. *California.*
- ✓ 2. **L. Algoensis**, Gray (*non* Sowb.), Zool. Jour. i, p. 498, 1824.  
 C. Ic. pl. 17, sp. 90. C. Ill. sp. 101, f. 26. Coq. Viv. p. 44, pl. 42, f. 2. *Algoa Bay.*
3. **L. angustata**, Gmel. (*non* Gray), Syst. Nat. p. 3421, 1790.  
 C. Ic. pl. 17, sp. 91. C. Ill. sp. 99, f. 105. Coq. Viv. p. 43, pl. 35, f. 2. *New Holland.*
4. **L. aurantia**, Martyn, Univ. C. ii, f. 59, 1782.  
 C. Ic. pl. 4, sp. 11.  
*C. aurora Solandri*, Chem., Conch. Cab. xi, pl. 180, f. 1737, 1738, 1795.  
 C. Ill. sp. 8, f. 41. Coq. Viv. p. 8, pl. 27, 28, f. 1. *Tahite.*
5. **L. Barclayii**, Reeve, Proc. Zool. Soc. p. 208, pl. 38, f. 4, 1857. *Diego Garcia.*
6. **L. Beckii**, Gask., Proc. Zool. Soc. p. 205, 1835.  
 C. Ic. pl. 22, sp. 125. C. Ill. f. 97. *Red Sea.*
7. **L. bicallosa**, Gray, C. Ill. sp. 50, f. 10, 1837.  
 C. Ic. pl. 16, sp. 79. Coq. Viv. p. 111, pl. 16, f. 2. *St. Vincent.*
8. **L. bicolor**, Gask., Proc. Zool. Soc. p. 92, 1848. *Australia.*
9. **L. Boivinii**, Kien., Coq. Viv. p. 66, pl. 18, f. 2. *Hab.—?*

\*This species may prove to be only a variety of *P. fimbriata*, Gmel.

10. **L. Broderipii**, Gray, Desc. Cat. p. 3, No. 18, 1832.  
C. Ic. pl. 5, sp. 13. C. Ill. sp. 20, f. 2. *Madagascar.*
11. **L. Bregeriana**, Crosse, Jour. de Conch. xvi, p. 277, 1868.  
Jour. de Conch. xvii, pl. 1, f. 2, 1869. *New Caledonia.*
12. **L. camelopardalis**, Perry, Conch. pl. 19, f. 5, 1811.  
C. Ill. sp. 16, f. 64, 65. Coq. Viv. p. 13, pl. 24, f. 1.  
*C. melanostoma*, Leathes, Tank. Cat. App. p. 31, 1825. C.  
Ic. pl. 6, sp. 17. *Red Sea.*
- ✓ 13. **L.? candida**, Pse., Proc. Zool. Soc. p. 515, 1865.  
Am. Jour. Conch. p. 95, pl. 11, f. 12, 13, 1868. *Central Pacific.*
14. **L. castanea**, Higgins, Proc. Zool. Soc. p. 178, pl. 14, f. 1,  
1868. *Hab.—?*
- ✓ 15. **L. caurica**, Linn., Syst. Nat. p. 1179, 1767.  
C. Ic. pl. 11, sp. 46. C. Ill. f. 158, 160. Coq. Viv. p.  
54, pl. 10, f. 2, 3.  
*C. dentex*, Humph., Cab. Cat. No. 116, 1779.  
*C. dracaena*, Born., Mus. p. 189, 1780.  
*C. corrosa*, Gron., Zooph. p. 129, 1783.  
*C. derosa*, Gmel., Syst. Nat. p. 3416, 1790.  
*C. elongata*, Perry, Conch. pl. 22, 1811.  
*Indian O. and Malayan Archipelago.*
- ✓ 16. **L. cinerea**, Gmel., Syst. Nat. p. 3402, 1790.  
C. Ic. pl. 22, sp. 124. C. Ill. sp. 15, f. 163. Coq. Viv.  
p. 84, pl. 26, f. 2.  
*C. sordida*, Lam., An. sans Vert. vii, p. 387, 1822.  
*C. translucens*, Gmel., Syst. Nat. p. 3404, 1790. *W. Indies.*
- ✓ 17. **L. citrina**, Gray (*non* Kiener\*), Zool. Jour. i, p. 509,  
1824.  
C. Ic. pl. 16, sp. 78. C. Ill. sp. 48, f. 9. *Madagascar.*
- ✓ 18. **L. clandestina**, Linn., Syst. Nat. p. 1177, 1767.  
C. Ic. pl. 19, sp. 106. C. Ill. sp. 94, f. 87. Coq. Viv. p.  
30, pl. 31, f. 4.  
*C. moniliaris*, Lam., An. sans Vert. vii, p. 396, 1822. *Ceylon.*
19. **L. compta**, Pse., Proc. Zool. Soc. p. 189, 1860. *Jarvis I.*

\* The figure given in Kiener's monograph is an *L. helvola*, Linn.

20. **L. contaminata**, Gray, Desc. Cat. p. 11, 1832.  
C. Ic. pl. 22, sp. 121. C. Ill. sp. 96, f. 21. Coq. Viv. p. 101, pl. 57, f. 5. *Hab.*—?
- ✓ 21. **L. cribraria**, Linn., Syst. Nat. p. 1178, 1767.  
C. Ic. pl. 16, sp. 81. C. Ill. sp. 75, f. 63. Coq. Viv. p. 26, pl. 29, f. 1.  
*C. comma*, Perry, Conch. pl. 21, f. 5, 1811. *Ceylon.*
22. **L. Cumingii**, Gray, Desc. Cat. No. 41, 1832.  
C. Ic. pl. 16, sp. 77. C. Ill. sp. 77, f. 5. Coq. Viv. p. 28, pl. 29, f. 3. *Society Islands.*
23. **L. dama**, Perry, Conch. pl. 23, f. 3, 1811.  
C. Ill. sp. 19, f. 100. Coq. Viv. p. 75, pl. 57, f. 2.  
*C. nivosa*, Brod., Zool. Jour. iii, p. 84, pl. 4, f. 1, 1827. C. Ic. pl. 7, sp. 25. *Hab.*—?
- ✓ 24. **L. eburnea**,\* Barnes, An. Lyc. N.<sup>o</sup>H. i, p. 133, pl. 9, f. 2, 1824.  
C. Ic. pl. 19, sp. 35. Coq. Viv. p. 60, pl. 8, f. 3. *Philippines.*
- ✓ 25. **L. erosa**, Linn., Syst. Nat. p. 1179, 1767.  
C. Ic. p. 11, sp. 43. C. Ill. sp. 53, f. 119, 171, 172. Coq. Viv. p. 53, pl. 9, f. 2, 3. *Indian O. and Malayan Archipelago.*
- ✓ 26. **L. erroneus**, Linn., Syst. Nat. p. 1178, 1767.  
C. Ic. pl. 13, sp. 56. C. Ill. sp. 80, f. 124, 128, 129, 132. Coq. Viv. p. 56, pl. 29, f. 4, 4a.  
*C. ovum*, Gmel., Syst. Nat. p. 3412, 1790.  
*C. subflava*, Gmel., Syst. Nat. p. 3413, 1790.  
*C. olivacea*, Lam., An. sans Vert. vii, p. 392, 1822. *Indian Ocean.*
27. **L. esontropia**, Ducl., Mag. Zool. p. 26, 1833.  
C. Ic. pl. 16, sp. 80. Coq. Viv. p. 27, pl. 29, f. 2. *Philippines.*
- ✓ 28. **L. flaveola**, Linn., Syst. Nat. p. 1179, 1767.  
C. Ic. pl. 18, sp. 95. C. Ill. sp. 52, f. 11.  
*C. labrolineata*, Gask., var., Proc. Zool. Soc. p. 97, 1848. *West Indies.*
29. **L. fusco-dentata**, Gray, Zool. Jour. i, p. 499, 1824.  
C. Ic. pl. 17, sp. 88. C. Ill. sp. 104, f. 28. Coq. Viv. p. 46, pl. 36, f. 3. *Cape of Good Hope.*

\*Mr. Sowerby has combined the three species, *Lamarckii*, *miliaris* and *eburnea*, calling the latter two varieties of the former. They are all, however, quite distinct.

- ✓ **30. *L. gangrenosa***, Sol. (*non* Gmel.) MSS. Dilw. Cat. 1, p. 465, No. 19, 1817.  
*C. Ic.* pl. 18, sp. 96. *C. Ill.* sp. 47, f. 8. *Coq. Viv.* p. 50, pl. 50, f. 2.  
*C. poraria*, Mart. (*non* Linn.) *Conch. i*, p. 304, pl. 30, f. 324, 325, 1768.  
*C. scabiosa*, Humph., *Cab. Cat.* No. 103.  
*C. Reentzii*, Dkr., var., Menke and Pfr. 1852, p. 189, and *Nov. Conch.* pl. 11, f. 3, 4, 1858. *China.*
- 31. *L. Gaskoinii***, Reeve, *Proc. Zool. Soc.* p. 23, 1846.  
*C. Ic.* pl. 22, f. 122. *Hab.* — ?
- 32. *L. Goodalii***, Gray, *Desc. Cat.* p. 10, 1832.  
*C. Ic.* pl. 22, sp. 120. *C. Ill.* sp. 76, f. 16.  
*Lord Hood's Island.*
- 33. *L. gracilis***, Gask., *Proc. Zool. Soc.* p. 93, 1848.  
*Bourbon.*
- ✓ **34. *L. guttata***, Rumph., *Amb. Rarit.* pl. 38, f. A, 1705.  
*C. tigris*, Linn., *Syst. Nat.* p. 1176, 1767.  
*C. Ic.* pl. 4, sp. 12. *C. Ill.* sp. 4, f. 90. *Coq. Viv.* p. 4, pl. 1, 4, 5, 6, f. 1.  
*C. flammea*, Gmel., *Syst. Nat.* p. 3408, 1790.  
*C. tigrina*, Gmel., *Syst. Nat.* p. 3404, 1790.  
*C. guttata*, Gmel., p. 3402, reference to fig. Lister, pl. 676, f. \*23. *Indian O. and Malayan Archipelago.*
- ✓ **35. *L. helvola***, Linn. *Syst. Nat.* p. 1180, 1767.  
*C. Ic.* pl. 15, sp. 72. *C. Ill.* sp. 49, f. 121. *Coq. Viv.* p. 69, pl. 28, f. 1.  
*C. citrina*, Kien. (*non* Gray) *Coq. Viv.* p. 70, pl. 43, f. 4.  
*Ceylon—Indian Ocean—Sandwich Islands.*
- 36. *L. Jenningsiana***, Perry, *Conch.* pl. 19, f. 4. 1811.  
*C. guttata*, Gmel. (*non* Gray) *Syst. Nat.* p. 3402, reference to fig. Mart. *Conch. i* pl. 25, f. 252, 253. *C. Ic.* pl. 8, sp. 30. *C. Ill.* sp. 43, f. 176. *Coq. Viv.* p. 52, pl. 43, f. 1. *Hab.* — ?
- 37. *L. Lamarekii***, Gray, *Zool. Jour.* i, p. 506, 1824.  
*C. Ic.* pl. 10, sp. 37. *C. Ill.* sp. 54, f. 12. *Coq. Viv.* p. 58, pl. 30, f. 2. *Indian Ocean.*
- 38. *L. lentiginosa***, Gray, *Zool. Jour.* i, p. 489, pl. 7, 12, f. 1, 1824.  
*C. Ic.* pl. 12, sp. 49. *C. Ill.* sp. 95, f. 139. *Coq. Viv.* p. 18, pl. 7, f. 2. *Ceylon.*

39. **L. leucodon**, Brod., Zool. Jour. iv, p. 163, pl. 6, 1828.  
C. Ic. pl. 7, sp. 23. C. Ill. sp. 9, f. 177—8. Coq. Viv. p. 76, pl. 55, f. 1. *Hab.* — ?
40. **L. Listerii**, Gray, Zool. Jour. i, p. 507, 1824.  
C. Ic. pl. 16, sp. 83. C. Ill. sp. 46, f. 114. Coq. Viv. p. 65, pl. 33, 41, f. 2. *Bengal.*
41. **L. lutea**, Gronov., Zoophylac. fasc. 3, pl. 19, f. 17, 1781.  
C. Ic. pl. 20, sp. 110.  
*C. Humphreysii*, Gray, Zool. Jour. i, p. 489, 1824. C. Ill. sp. 71, f. 55. Coq. Viv. p. 40, pl. 14, f. 4, pl. 57, f. 1. *Hab.* — ?
- ✓ 42. **L. lynx**, Linn., Syst. Nat. p. 1176, 1767.  
C. Ic. pl. 9, sp. 3. C. Ill. sp. 12, f. 107. Coq. Viv. p. 10, pl. 25, 38, f. 2.  
*C. Vanelli*, Linn., Syst. Nat. p. 1175, 1767.  
*C. squalina*, Gmel., Syst. Nat. p. 3420, 1790.  
*C. Caledonica*, Crosse., var., Jour. de Conch. xvii, p. 41, pl. 1, f. 1, 1869. *Indian Ocean, Pacific O.*
43. **L. margarita**, Sol., MSS. Zool. Jour. iv, p. 87, 1828.  
C. Ic. pl. 22, sp. 123. C. Ill. sp. 37, f. 6. Coq. Viv. p. 100, pl. 56, f. 4. *Annaa I.*
44. **L. Menkeana**, Desh., Conch. I. Reunion, p. 139, pl. 13, f. 21, 22, 1863. *Bourbon.*
- ✓ 45. **L. miliaris**, Gmel., Syst. Nat. p. 3420, 1790.  
C. Ic. pl. 10, sp. 36. Coq. Viv. p. 59, pl. 8, f. 2. *Japan.*
- ✓ 46. **L. montosa**, Rumph., Amb. Rarit, p. 114, pl. 38, f. B, 1705.  
*C. mappa*, Linn., Syst. Nat. p. 1173, 1767. C. Ic. pl. 6, sp. 18. C. Ill. sp. 2, f. 76. Coq. Viv. p. 9, pl. 20, f. 1, 2.  
*C. alga*, Perry, Conch. pl. 23, f. 1, 1811. *Annaa I.*
- ✓ 47. **L. nigropunctata**, Gray, Zool. Jour. iv, p. 81, 1828.  
C. Ic. pl. 13, sp. 59. C. Ill. sp. 89, f. 22. Coq. Viv. p. 31, pl. 2, f. 2.  
*C. irina*, Kien., Coq. Viv. p. 35, pl. 56, f. 2. *Gallipagos I.*
- ✓ 48. **L. ocellata**, Linn., Syst. Nat. p. 1180, 1767.  
C. Ic. pl. 15, sp. 73. Coq. Viv. p. 67, pl. 49, f. 3. C. Ill. sp. 55, f. 67. *Ceylon.*
- ✓ 49. **L. onyx**, Linn., Syst. Nat. p. 1177, 1767.  
C. Ic. pl. 10, sp. 39. C. Ill. sp. 84, f. 17. Coq. Viv. p. 16, pl. 44, f. 1.

- C. adusta*, Chem. (*non* Lam.) var., Conch. Cab. x, p. 106, pl. 145, f. 1341, 1790.  
*C. nymphaea*, Ducl. —?  
*C. pulla*, Gmel., Syst. Nat. p. 3412, 1790.  
*C. succincta*, Linn., Syst. Nat. p. 1177, 1767. *San Diego I.*
50. **L. pallida**, Gray, Zool. Jour. i, p. 387, 1824.  
 C. Ic. pl. 13, sp. 54. C. Ill. sp. 90, f. 19, 76. Coq. Viv. p. 64, pl. 51, f. 1. *Hab. —?*
51. **L. pantherina**, Sol., MSS. Dilw. Cat. i, p. 499, 1817.  
 C. Ic. pl. 3, sp. 7. C. Ill. sp. 5, f. 8, 134.  
*C. guttata*, Lam. (*non* Rumph.) An. du Mus. xv, p. 453, 1810.  
*C. tigrina*, Lam., An. sans Vert. vii, p. 383, 1822.  
*Red Sea—Indian O.*
52. **L. physis**, Brocchi, (in aet. fos.) Conch. foss. Subap. ii, p. 284, pl. 2, f. 3, 1814.  
 C. Ic. pl. 12, sp. 47.  
*C. achatidea*, Gray, (*non* Sowb.) C. Ill. f. 179, 1837.  
*C. Grayi*, Kien., Coq. Viv. p. 20, pl. 26, f. 3.  
*Mediterranean Sea.*
53. **L. picta**, Gray, Zool. Jour. i, p. 389, pl. 7, 12, f. 10, 1824.  
 C. Ic. pl. 13, sp. 57. C. Ill. sp. 86, f. 162. Coq. Viv. p. 34, pl. 56, f. 6. *Gambia.*
54. **L. piperita**, Sol., MSS. Zool. Jour. i, p. 498, 1824.  
 C. Ic. pl. 17, sp. 87. C. Ill. sp. 100, f. 24.  
*C. Comptoni*, Gray, var. Proc. Zool. Soc. p. 170, 1865.  
*Australia.*
55. **L. polita**, Roberts, Am. Jour. Conch. iv, p. 70, pl. 15, f. 1—3, 1868. *Sandwich Islands.*
56. **L. poraria**, Linn., Syst. Nat. p. 1180, 1767.  
 C. Ic. pl. 18, sp. 99. C. Ill. sp. 44, f. 68. Coq. Viv. p. 51, pl. 49, f. 2. *Sandwich I.*
57. **L. pulchella**, Swm., Phil. Mag. lxi, p. 376, 1823.  
 C. Ic. pl. 11, sp. 42. C. Ill. sp. 28, f. 40. Coq. Viv. p. 25, pl. 23, f. 2. *China Sea.*
58. **L. punctata**, Linn., Mantissa. p. 548, 1771.  
 C. Ic. pl. 19, sp. 101. C. Ill. sp. 67, f. 117.  
*C. atomaria*, Gmel., Syst. Nat. p. 3412, 1790.  
*C. stercus-muscarum*, Lam., An. sans Vert. vii, p. 396, 1822.  
*Philippines.*
59. **L. punctulata**, Gray, Zool. Jour. i, p. 387, 1824.  
 C. Ic. pl. 13, sp. 61. C. Ill. sp. 20, f. 20. Coq. Viv. p. 114, pl. 21, f. 2. *Mazatlan—Panama.*



60. **L. pyriformis**, Gray, Zool. Jour. i, p. 371, 1824.  
 C. Ic. pl. 12, sp. 52. C. Ill. sp. 69, f. 23. Coq. Viv. p.  
 42, pl. 55, f. 2. *New Holland—Ceylon.*
61. **L. pyrum**, Gmel., Syst. Nat. p. 3411, 1790.  
 C. Ic. pl. 8, sp. 26. C. Ill. sp. 85, f. 72. Coq. Viv. p.  
 13, pl. 28, f. 2.  
*C. rufa*, Lam., An. sans Vert. vii, p. 388, 1822.  
*C. flaveola*, Born. (*non* Linn.) Mus. p. 190, 1778.  
*Mediterranean Sea.*
62. **L. Reeveii**, Gray, C. Ill. sp. 15\*, f. 52, 1837.  
 C. Ic. pl. 11, sp. 41. Coq. Viv. p. 86, pl. 37, f. 2.  
*E. Indies.*
- ✓ 63. **L. salita**, Rumph., Amb. Rarit. pl. 38, f. L, 1705.  
*C. vitellus*, Linn., Syst. Nat. p. 1176, 1767. C. Ic. pl. 5, sp.  
 14. C. Ill. sp. 13, f. 66. Coq. Viv. p. 12, pl. 19, f. 1.  
*C. dama*, Humph., Cab. Cat. No. 118, 1779.  
*C. fulva*, Gmel., Syst. Nat. p. 3413, 1790. *Indian Ocean.*
64. **L. sanguinolenta**, Gmel., Syst. Nat. p. 3406, 1790.  
 C. Ic. pl. 19, sp. 102. C. Ill. sp. 97, f. 108. Coq. Viv.  
 p. 32, pl. 33, f. 1.  
*C. purpurascens*, Swn., Phil. Mag. lxi, p. 376, 1823. *Gambia.*
65. **L. Sauliæ**, Gask., Proc. Zool. Soc. p. 23, 1843.  
 C. Ic. pl. 14, sp. 62. *Bay of Manilla.*
66. **L. semiplota**, Mighels, Proc. Bost. Soc. ii, p. 24, 1848.  
*Oahu.*
67. **L. similis**, Gray, Zool. Miscel. p. 36.  
 C. Ic. pl. 17, sp. 89. C. Ill. sp. 103, f. 27. Coq. Viv. p.  
 17, pl. 19, f. 2. *C. of Good Hope.*
- ✓ 68. **L. Sowerbyii**, Kien., Coq. Viv. p. 38, pl. 7, f. 3.  
 C. Ic. pl. 10, sp. 40.  
*C. ferruginosa*, Kien., Coq. Viv. p. 37, pl. 56, f. 3.  
*C. zonata*, Lam., (*non* Gray,) An. sans Vert. p. 386, 1822.
69. **L. spadicea**, Swn., Phil. Mag. lxi, p. 376, 1823.  
 C. Ic. pl. 7, sp. 21. C. Ill. sp. 83, f. 95. Coq. Viv. p.  
 14, pl. 22, f. 1. *New Holland.*
70. **L. spadix**,\* Mighels, Proc. Bost. Soc. ii, p. 24, 1848.  
*Oahu.*

\* This species has very much the appearance of an immature *L. semiplota*, but with my present knowledge of it I do not feel safe in placing it in the synonymy of the latter.

71. **L. spurca**, \* Linn., Syst. Nat. p. 1179, 1767.  
 C. Ic. pl. 14, sp. 68. C. Ill. sp. 51, f. 53, 81, 104. Coq.  
 Viv. p. 61, pl. 30, f. 1.  
*C. acicularis*, Gmel., Syst. Nat. p. 3421, 1790.  
*C. flaveola*, Lam. (*non* Linn.), An. sans Vert. vii, p. 394, 1822.  
*West Indies.*
72. **L. subviridis**, Rve., C. Ic. pl. 12, sp. 48, 1845.  
 C. Ill. f. 180. Coq. Viv. p. 41, pl. 13, f. 2. *Australia.*
73. **L. Thomasi**, Crosse, Jour. de Conch. p. 57, pl. 6, f. 3,  
 1865. *Hab. — ?*
74. **L. umbilicata**, Sowb., Tank. Cat. app. p. 30, 1825.  
 C. Ill. f. 169. *Australia.*
75. **L. undata**, Lam., An. sans Vert. vii, p. 393, 1822.  
 C. Ill. sp. 93, f. 109. Coq. Viv. p. 21, pl. 30, f. 3.  
*C. diluculum*, Rve., C. Ic. pl. 14, sp. 65, 1845. *Philippines.*
76. **L. Valentia**, Perry, Conch. pl. 23, f. 2, 1811.  
*C. princeps*, Gray, Zool. Jour. i, p. 75, 1824. C. Ic. pl. 6,  
 sp. 20. C. Ill. f. 20. Coq. Viv. p. 7, pl. 7, 8, f. 1.  
*Persian Gulf.*
77. **L. variola**, Rumph., Amb. Rarit. pl. 38, f. O, 1705.  
*C. cruenta*, Gmel., Syst. Nat. p. 3420, 1790. C. Ic. pl. 10,  
 sp. 38. C. Ill. sp. 79, f. 112.  
*C. morbillosa*, Sol. MSS., Dillw. Cat. 1817.  
*C. variolaria*, Lam., An. sans Vert. vii, p. 387, 1822. Kien.  
 Coq. Viv. p. 57, pl. 27, f. 2, 3. *New Guinea.*
78. **L. Walkerii**, Gray, Desc. Cat. p. 11, 1832.  
 C. Ic. pl. 12, sp. 50. C. Ill. sp. 70, f. 22.\* Coq. Viv. p.  
 33, pl. 14, f. 2. *New Holland.*
79. **L. Xanthodon**, Gray, Desc. Cat. p. 10, 1832.  
 C. Ic. pl. 13, sp. 55. C. Ill. sp. 88, f. 18. Coq. Viv. p.  
 39, pl. 57, f. 2. *Hab. — ?*
80. **L. zigzag**, Linn., Syst., Nat. p. 1177, 1767.  
 C. Ic. pl. 18, sp. 97. C. Ill. f. 143. Coq. Viv. p. 22, pl.  
 31, f. 2.  
*C. undulata*, Wood, Supp. p. 87, pl. 17, f. 16. *Mozambique.*
81. **L. zonata**, Chem., Conch. Cab. x, pl. 145, f. 1342, 1788.  
 C. Ic. pl. 13, f. 58. Coq. Viv. p. 19, pl. 48, f. 1.  
*C. nebulosa*, Kien., var., Coq. Viv. p. 63, pl. 32, f. 3.  
*C. zonaria*, Gmel., Syst. Nat. p. 3414, 1788. *Gambia.*

\*The *C. lota* of Linn. (*non* Lam.), is probably a worn *C. spurca*.

Genus **GASKOINIA**,\* Roberts.

1. **G. edentula**, Sowb., C. Ill. sp. 102, f. 26,\* 1837.  
C. Ic. pl. 17, sp. 85, a, b. Coq. Viv. p. 53, pl. 9, f. 2, 3.  
*South Africa.*

Genus **ARICIA**, Gray.

Desc. Cat. Cyp., 1832.

1. **A. ? Annæ**, Roberts, Am. Jour. Conch., iv, p. 250, pl. 15,  
f. 4—6, 1868. *Sandwich Islands.*
- ✓ 2. **A. annulus**, Linn., Syst. Nat. p. 1179, 1767.  
C. Ic. pl. 15, sp. 71. C. Ill. sp. 58, f. 115. Coq. Viv. p.  
124, pl. 34, f. 2.  
*C. Noumeensis*, Marie, var. Jour. de Conch. xvii, p. 18, pl. 2,  
f. 6, 1869. *Indian Ocean.*
- ✓ 3. **A. Arabica**, Linn., Syst. Nat. p. 1173, 1767.  
C. Ic. pl. 1, sp. 2. C. Ill. sp. 3, f. 85. Coq. Viv. p. 105,  
pl. 17, f. 1, 2.  
*C. amethystia*, Linn., Syst. Nat. 1174, 1767.  
*C. fragilis*, Linn., Syst. Nat. 1175, 1767.  
*C. elegantina*, Ducl., var., Guer. Mag. p. 28, 1833.  
*Indian Ocean.*
- ✓ 4. **A. arabicula**, Lam., An. sans Vert. vii, p. 399, 1822.  
C. Ic. pl. 13, sp. 60. C. Ill. sp. 11, f. 77. Coq. Viv. p.  
115, pl. 28, f. 3. *Acapulco.*
- ✓ 5. **A. arenosa**, Gray, Zool. Jour. p. 147, 1824.  
C. Ic. pl. 18, sp. 27. C. Ill. sp. 18, f. 75. Coq. Viv. p.  
118, pl. 11, f. 4. *Annaa Island.*
6. **A. caput-anguis**, Philippi,† Menke & Pfr. p. 24, 1849.  
*Hab. — ?*
- ✓ 7. **A. caput-serpentis**, Linn., Syst. Nat. p. 1175, 1767.  
C. Ic. pl. 11, sp. 44. C. Ill. sp. 57, f. 127, 131. Coq.  
Viv. p. 112, pl. 49, f. 1.  
*C. albella*, Lam., An. sans Vert. vii, p. 404, 1822.  
*C. reticulum*, Gmel., Syst. Nat. p. 3407, 1790.  
*Indian Ocean—Takeite.*
8. **A. ? fabula**, Kien., Coq. Viv. p. 97, pl. 54, f. 3.  
C. Ic. pl. 19, sp. 105a. *Indian Ocean.*

\* Shell entirely devoid of teeth; in other respects resembling *Luponia*. This genus is respectfully dedicated to Mr. J. S. Gaskoin, of England, who has devoted many years to the study of this family.

† Probably a variety of *A. caput-serpentis*, Linn.

- ✓ 9. **A. histrio**, Meusch, (*non* Gmel.) Mus. Gevers, p. 404, 1787.  
Coq. Viv. p. 104, pl. 18, f. 1. C. Ill. f. 80.  
*C. arlequina*, Chem., Conch. Cab. x. p. 145, f. 1346-7, 1790.  
*Indian Ocean.*
10. **A. leucostoma**, Gask., Proc. Zool. Soc. p. 25, 1843.  
C. Ic. pl. 7, sp. 22. *Mocha.*
11. **A. marginata**, Gask., Proc. Zool. Soc. p. 91, 1848.  
*Hab. — ?*
- ✓ 12. **A. Mauritiana**, Linn., Syst. Nat. p. 1176, 1767.  
C. Ic. pl. 1, sp. 1. C. Ill. sp. 6, f. 164. Coq. Viv. p. 103,  
pl. 39, 40, 41, f. 1.  
*C. fragilis*, Born., Mus. p. 179, pl. 8, f. 6, 1780.  
*C. regina*, Chem., Conch. Cab. x, p. 101, 1788.  
*C. trifasciata*, Gmel., Syst. Nat. 3405, 1790.  
*C. turbinata*, “ “ “ 3404, “  
*C. undulata*, Gmel (*non* Wood), Syst. Nat. 3406, 1790.  
*Indian Ocean—Mauritius.*
- ✓ 13. **A. moneta**, Linn., Syst. Nat. p. 1178, 1767.  
C. Ic. pl. 15, sp. 74. C. Ill. sp. 60, f. 123, 130. Coq.  
Viv. p. 122, 123, pl. 34, f. 1, 3.  
*C. icterina*, Lam., An. sans Vert. vii, p. 387, 1822.  
*C. Barthelemyi*, Bernardi, var. Jour. de Conch. p. 48, pl. 1,  
1861. *Feejee Islands—N. Caledonia.*
- 14. **A. mus**, Linn., Syst. Nat. p. 1176, 1767.  
C. Ic. pl. 7, sp. 24. C. Ill. f. 156, 157. Coq. Viv. p. 120,  
pl. 25, f. 1.  
*C. autumnalis*, Perry, Conch. pl. 21, f. 2, 1811. *West Indies.*
- ✓ 15. **A. obvelata**, Lam., An. sans Vert. vii, p. 401, 1822.  
C. Ic. pl. 15, sp. 69. C. Ill. sp. 59, f. 13. Coq. Viv. p.  
125, pl. 34, f. 4. *Pacific Ocean.*
16. **A. pardalina**, Dunker, Zeit. fur Malak. p. 126, 1852.  
*Hab.—?*
17. **A. reticulata**, Martyn, Univ. C. pl. 15, 1782.  
C. Ic. pl. 1, sp. 3. C. Ill. f. 166. Coq. Viv. p. 104, pl.  
18, f. 1.  
× *C. maculata*, Barnes, An. Lyc. N. H. i, p. 132, 1824.  
*C. intermedia*, Gray, var. Zool. Jour. i, p. 77, 1824.  
*Polynesian Islands, Pacific Ocean.*
18. **A. Scottii**, Brod., Zool. Jour. v, p. 330, pl. 14, 1831.  
C. Ic. pl. 14, sp. 10. C. Ill. sp. 33, f. 44. Coq. Viv. p.  
110, pl. 14, f. 1.  
*C. Friendii*, Gray, Desc. Cat. p. 5, 1832. *New Holland.*

- ✓ 19. **A. Stercoraria**, Linn., Syst. Nat. p. 1174, 1767.  
 C. Ic. pl. 5, sp. 15. C. Ill. sp. 7, f. 167. Coq. Viv. p.  
 109, pl. 12, f. 1; p. 108, pl. 11, f. 1, 2.  
*C. cauteriata*, Chem., Conch. Cab. x, pl. 144, f. 1332, 1788.  
*C. fasciata*, " " " " 1334, "  
*C. conspurcata*, Gmel., Syst. Nat. p. 3405, 1790.  
*C. gibba*, " " " " 3403, "  
*C. olivacea*, " " " " 3408, "  
*C. nebulosa*, Gmel. (*non* Kien.), Syst. Nat. p. 3413, 1790.  
*C. grummulus*, Humph., Cab. Cat. No. 112, 1779.  
*C. rattus*, Lam., An. sans Vert. vii, p. 380, 1822. *Africa*.
20. **A. sulcidentata**, Gray, Zool. Jour. i, p. 148, 1824.  
 C. Ic. pl. 8, sp. 29. C. Ill. sp. 10, f. 110. Coq. Viv. p.  
 117, pl. 21, f. 3. *South Seas*.
21. **A. tessellata**, Swin., Zool. Jour. i, p. 150, 1824.  
 C. Ic. pl. 12, sp. 53. C. Ill. sp. 55, f. 94. Coq. Viv. p.  
 119, pl. 22, f. 3. *New Zealand*.
22. **A. thersites**, Gask., Proc. Zool. Soc. p. 90, 1848.  
*Hab.—?*
- ✓ 23. **A. turdus**, Lam., An. sans Vert. vii, p. 392, 1822.  
 C. Ic. pl. 9, sp. 31. C. Ill.\* sp. 56, f. 173. Coq. Viv. p.  
 62, pl. 4, f. 2.  
*C. nivea*, Gray (*non* Sol.), Zool. Jour. i, p. 511, 1824. Proc.  
 Zool. Soc. p. 98, 1848.  
*C. ovula*, Perry, Conch. pl. 21, f. 3, 1811. *Persian Gulf*.
- ✓ 24. **A. ventriculus**, Lam., An. du Mus. xvi, p. 452, 1810.  
 C. Ic. pl. 8, sp. 28. Coq. Viv. p. 116, pl. 38, f. 3.  
*C. achatina*, Sol. MSS. Dilw. Cat. i, p. 446, 1817.  
*C. carneola*, Martyn (*non* Linn.), Univ. C. pl. 14, 1782.  
*Pacific Ocean*.

Genus **CYPRÆOVULA**, Gray.

Zool. Jour. i, p. 75, 1824.

1. **C. Adamsonii**, Gray, Desc. Cat. p. 7, 1832.  
 C. Ic. pl. 24, sp. 135. C. Ill. sp. 107, f. 7. Coq. Viv. p.  
 159, pl. 46, f. 3. *I. Capul*.
2. **C. Capensis**, Gray, Zool. Jour. iii, p. 573, 1828.  
 C. Ic. pl. 17, sp. 86. C. Ill. f. 101. Coq. Viv. p. 158,  
 pl. 15, f. 2. *Cape of Good Hope*.

\* Figure 54 in Sowerby's monograph looks very much like a young shell, and is no doubt the *L. eburnea*, Barnes. It is not a *turdus*.

Genus **EPONA**, H. and A. Adams.

Genera Recent Mollusca, i, p. 269, 1858.

1. **E. annulata**, Gray, Zool. Jour. iv, p. 88, 1829.  
C. Ic. pl. 21, sp. 114. C. Ill. f. 4. Coq. Viv. p. 157, pl. 14, f. 2. *Annaa Island.*
- ✓ 2. **E. cicercula**, Linn., Syst. Nat. p. 1181, 1767.  
C. Ic. p. 21, sp. 116. C. Ill. sp. 38, f. 84. Coq. Viv. p. 156, pl. 50, f. 3. *Malayan Archipelago.*
- ✓ 3. **E. globuli**, Rumph., Amb. Rarit. pl. 39, f. L, 1705.  
*C. globulus*, Linn., Syst. Nat. p. 1181, 1767. C. Ic. pl. 21, sp. 118. C. Ill. sp. 39, f. 78.  
*C. affinis*, Gmel., Syst. Nat. p. 3420, 1790. *Asiatic Ocean.*

Genus **PUSTULARIA**, Swainson.

Man. Malacology, p. 325, 1840.

1. **P. granulata**, Pse., Proc. Zool. Soc. p. 278, 1862.  
*Pacific Ocean.*
2. **P. limacina**, Lam., An. sans Vert. vii, p. 400, 1822.  
Coq. Viv. p. 47, pl. 35, f. 1; pl. 22, f. 2.  
*C. interstincta*, Wood, Index Supp. pl. 3, f. 9, 1828.  
*Philippines.*
3. **P. Madagascariensis**, Gmel., Syst. Nat. p. 3419, 1790.  
C. Ic. pl. 15, sp. 75. C. Ill. sp. 42, f. 116. Coq. Viv. p. 126, pl. 3, f. 4. *Pacific Ocean—Madagascar?*
- ✓ 4. **P. nucleus**, Linn., Syst. Nat. p. 1181, 1767.  
C. Ic. pl. 15, sp. 70. C. Ill. sp. 41, f. 86. Coq. Viv. p. 127, pl. 3, f. 2.  
*C. gemmosa*, Perry, Conch. pl. 23, 1811.  
*Indian Ocean.—Polynesia.*
- ✓ 5. **P. pustulata**, Lam., An. du Mus. xv. p. 101, 1810.  
C. Ic. pl. 15, sp. 76. C. Ill. sp. 106, f. 71. Coq. Viv. p. 128, pl. 2, f. 3. *Mazatlan—Panama.*
6. **P. Staphylœa**, Linn., Syst. Nat. p. 1181, 1767.  
C. Ic. pl. 16, sp. 82. C. Ill. sp. 40, f. 83. Coq. Viv. p. 48, pl. 36, f. 2. *Sandwich Islands—Indian Ocean.*

Genus **TRIVIA**, Gray.

Desc. Cat. Cyp. 1832.

1. **T. acutidentata**, Gask., Proc. Zool. Soc. p. 201, 1835.  
*Bay of Guyaquil.*



2. **T. affinis**,\* Marratt (*non* Gmel.), An. Mag. N. H. xx, p. 214, 1867. *West Indies?*
3. **T. armandina**,† Duclos, Coq. Viv. p. 140, pl. 46, f. 2. *West Indies.*
4. **T. Australis**, Lam. (*non* Gray), An. sans Vert. vii, p. 404, 1822.  
C. Ic. pl. 24, sp. 138. C. Ill. sp. 112, f. 29. Coq. Viv. p. 138, pl. 48, f. 2. *New Holland.*
5. **T. Californica**, Gray, Zool. Jour. iii, p. 365, 1827.  
C. Ic. pl. 23, f. 128. C. Ill. f. 42. *California.*
6. **T. candidula**, Gask., Proc. Zool. Soc. p. 200, 1835.  
C. Ic. pl. 26, f. 151. C. Ill. f. 149. Coq. Viv. p. 150, pl. 53, f. 1. *Western Islands, Mexico.*
7. **T. Childreni**, Gray, Zool. Jour. i, p. 518, 1824.  
C. Ic. pl. 21, f. 115. C. Ill. f. 169. Coq. Viv. p. 155, pl. 40, f. 3. *Annaa Island.*
8. **T. corrugata**, Psc., Am. Jour. Conch. iv, p. 95, pl. 11, f. 14, 15, 1868. *Paumotus.*
9. **T. costata**, Gmel., Syst. Nat. p. 3418, 1790.  
C. Ic. pl. 20, sp. 109. C. Ill. f. 137. Coq. Viv. p. 136, pl. 47, f. 4.  
*C. rosea*, Wood, Index Supp. pl. 3, f. 15, 1828.  
*C. triticea*, Dufr., Blainv. Dict. p. 43, pl. 25, 1824.  
*C. carnea*, Gray, Zool. Jour. iii, p. 569, 1828. *West Indies.*
10. **T. depauperata**, Sowb., C. Ill. sp. 130, f. 49, 1837.  
C. Ic. pl. 23, sp. 133. Coq. Viv. p. 131, pl. 47, f. 2. *California.*
11. **T. Europæa**, Montague, Test. Brit. Supp. p. 88, 1808.  
C. Ic. pl. 23, sp. 129. C. Ill. f. 142, 142\*.  
*C. pediculus*, var., Mont., Test. Brit. i, p. 200, 1803.  
*C. bullata*, Mont., Test. Brit. i, p. 202, 1803.  
*C. Arctica*, Mont., Test. Brit. i, p. 201, 1803.  
*C. coccinella*, Lam., An. sans Vert. vii, p. 404, 1822. Coq. Viv. p. 139, pl. 52, f. 4—6. *Britain.*
12. **T. exigua**, Gray, Desc. Cat. Cyp. p. 15, 1832.  
C. Ill. sp. 118, f. 35.  
*C. tremeza*, Ducl., Mag. de Zool. pl. 25, 1833. C. Ic. pl. 26, sp. 148. Coq. Viv. p. 154, pl. 55, f. 4.  
*C. gemmula*, Gld., Proc. Bost. Soc. ii, p. 27, 1845. *Sandwich I.—Caledonia.*

\* Closely allied to *T. producta*, Gask.

† The distinctness of this species is somewhat doubtful.

13. **T. formosa**, Gask., Proc. Zool. Soc. p. 198, 1835.  
C. Ic. pl. 23, sp. 132. C. Ill. f. 151. Coq. Viv. p. 137,  
pl. 52, f. 3. *Cape of Good Hope.*
14. **T. fusca**, Desc. Cat. p. 15.  
C. Ic. pl. 24, sp. 134. C. Ill. f. 37. *Gallipagos I.*
15. **T. Gaskoinii**, Roberts.  
*C. sulcata*, Gask. (*non* Dillw.), Proc. Zool. Soc. p. 95, 1848.  
*Manilla.*
16. **T. globosa**, Gray, Desc. Cat. p. 14, 1832.  
C. Ic. pl. 26, sp. 152. C. Ill. f. 34.  
*C. pilula*, Kien., Coq. Viv. p. 151, pl. 54, f. 2.  
*West Indies—China Seas?*
17. **T. grando**, Gask., Proc. Zool. Soc. p. 96, 1848. *Manilla.*
18. **T. insecta**, Mighels, Proc. Bost. Soc. ii, p. 24, 1845.  
*C. hordacea*, Kien., Coq. Viv. p. 149, pl. 54, f. 5.  
*Sandwich Islands.*
19. **T. Maugeriæ**, Gray, Desc. Cat. p. 13, 1832.  
C. Ic. pl. 21, sp. 119, C. Ill. f. 30. *Gallipagos.*
20. **T. napolina**, Ducl., Coq. Viv. p. 144, pl. 53, f. 3.  
C. Ic. pl. 26, sp. 149.  
*C. obscura*, Gask., Proc. Zool. Soc. p. 94, 1848. *Senegal.*
21. **T. oniscus**, Lam., An. du Mus. xvi, p. 103, 1810.  
C. Ic. pl. 20, f. 111. C. Ill. sp. 109, f. 134. Coq. Viv.  
p. 134, pl. 51, f. 2.  
*C. aperta*, Swin. (*non* Gray), Zool. Jour. iii, p. 571, 1827.  
*Cape of Good Hope.*
22. **T. ovula**, Lam., An. sans Vert. vii, p. 398, 1822.  
C. Ic. pl. 20, sp. 112. C. Ill. f. 145. Coq. Viv. p. 135,  
pl. 51, f. 3. *Cape of Good Hope.*
23. **T. Pacifica**, Gray, Desc. Cat. p. 15, 1832.  
C. Ic. pl. 25, sp. 143. C. Ill. f. 39. Coq. Viv. p. 147,  
pl. 45, f. 2. *Gallipagos.*
- ✓ 24. **T. pediculus**,\* Rumph., Amb. Rarit. pl. 39, f. P, 1705.

\*The shell *C. nivea*, figured by Reeve, C. Ic. pl. 24, sp. 136, is the *C. oryza*, Lam., which is *T. pediculus*, Rumph. The *C. oryza* figured by Reeve, C. Ic. pl. 24, sp. 140, is the *T. scabriuscula*, Gray. The same error occurs in Sowerby's Conch. Illus. M. Kiener has confounded the two species *T. scabriuscula*, Gray (Coq. Viv. pl. 43, f. 3), and *T. oryza*, Lam. (Coq. Viv. pl. 52, f. 2); the figures should be reversed. The true *C. nivea*, Gray (Zool. Jour. i, p. 511), is a white variety of *C. turdus*, Lam., and has been placed in the synonymy of the latter species, see Proc. Zool. Soc. 1848, p. 98.

*C. oryza*, Lam. An. du Mus. xvi, p. 104, 1810.

*C. nivea*, Sol., Dilw. Cat. i, p. 466, 1817.

*C. pediculus*, Linn. (in part), Syst. Nat. p. 1180, 1767.

*Ticao.*

25. **T. pellucidula**, Gask., Proc. Zool. Soc. p. 23, 1846.

*C. Ic. pl. 26, sp. 153.*

*South Pacific.*

26. **T. pisum**, Gask., Proc. Zool. Soc. p. 24, 1846.

*C. Ic. pl. 26, sp. 154.*

*East Indies.*

27. **T. producta**, Gask., Proc. Zool. Soc. 1835, p. 200; 1848, p. 98.

*C. Ic. pl. 24, sp. 137. C. Ill, f. 155. Coq. Viv. p. 153, pl. 53, f. 5.*

*Hab.—?*

28. **T. pulex**, Sol., Zool. Jour. iii, p. 368, 1827.

*C. Ic. pl. 25, sp. 143. C. Ill. sp. 123, f. 32. Coq. Viv. p. 142, pl. 53, f. 1.*

*Mediterranean.*

29. **T. pulla**, Gask., Proc. Zool. Soc. 1846, p. 24; 1848, p. 97.

*C. Ic. pl. 26, sp. 150.*

*Gallipagos Islands.*

30. **T. quadripunctata**, Gray, Zool Jour. iii, p. 368, 1827.

*C. Ic. pl. 25, sp. 146. C. Ill. sp. 116, f. 33.*

*C. rotunda*, Kien., Coq. Viv. p. 141, pl. 53, f. 2.

*West Indies.*

31. **T. radians**, Lam., An. sans Vert. vii, p. 402, 1822.

*C. Ic. pl. 21, sp. 117. C. Ill. sp. 129, f. 146. Coq. Viv. p. 129, pl. 3, f. 3.*

*Mazatlan—Ecuador.*

32. **T. rubescens**, Gray, Proc. Zool. Soc. p. 185, 1832.

*C. Ic. pl. 25, sp. 141.*

*Gallipagos Islands.*

33. **T. rubinicolor**, Gask., Proc. Zool. Soc. p. 200, 1835.

*C. Ic. pl. 25, sp. 145. C. Ill. f. 150.*

34. **T. sanguinea**, Gray, Desc. Cat. p. 14, 1832.

*C. Ill. sp. 115, f. 32. C. Ic. pl. 23, f. 127.*

*C. lathyrus*, Dufr., Coq. Viv. p. 146, pl. 22, f. 4.

*Mazatlan—Ecuador.*

35. **T. scabriuscula**,\* Gray, Zool. Jour. iii, p. 364, 1827.

*C. intermedia*, Kien., Coq. Viv. pl. 54, f. 1. *African Coast.*

36. **T. Solandri**, Gray, C. Ill. sp. 128, f. 43, 1837.

*C. Ic. pl. 21, sp. 113. Coq. Viv. p. 130, pl. 47, f. 3.*

*Pacific Ocean.*

37. **T. sphærula**, Mighels, Proc. Bost. Soc. ii, p. 24, 1848.

*Oahu.*

\* See remarks under *T. pediculus*, Rumph.

38. **T. subrostrata**, Gray, Zool. Jour. iii, p. 363, 1827.  
C. Ic. pl. 26, sp. 147. C. Ill. f. 36. Coq. Viv. p. 152,  
pl. 45, f. 3. *West Indies.*
39. **T. suffusa**, Gray, Desc. Cat. Cyp. p. 16, 1832.  
C. Ill. sp. 126, f. 41. C. Ic. pl. 25, sp. 142. *West Indies.*
40. **T. sulcata**, Dilw. (*non* Gask.), Cat. i, p. 466, 1817.  
*C. pediculus*, Linn. (in part), Syst. Nat. p. 1180, 1767. C. Ic.  
pl. 23, sp. 131. C. Ill. sp. 124, f. 148, 153. Coq. Viv.  
p. 132, pl. 40, f. 2.  
*C. labiosa*, Gask., Proc. Zool. Soc. p. 202, 1835. *West Indies.*
41. **T. vesicularis**, Gask., Proc. Zool. Soc. p. 203, 1835.  
C. Ic. pl. 20, sp. 108. C. Ill. f. 120, 154. *Cape of Good Hope.*
42. **T. vitrea**, Gask., Proc. Zool. Soc. p. 95, 1848. *Philippines.*
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## Fam. **AMPHIPERASIDÆ.**

Genus **AMPHIPERAS**, Gron.

Zoophylacium, 1781.

*Ovulum*, Brug., Enêyc. Meth. 1791.

*Simnea*,\* Risso, Hist. Nat. Europe. Merid.

1. **A. Adamsii**, Sowb., C. Ic. pl. 5, sp. 24, 1865.  
*O. marginatum*, Ad. (*non* Sowb.), Proc. Zool. Soc. p. 30,  
1854. *New Caledonia.*
2. **A. alabaster**, Sowb., C. Ic. pl. 5, sp. 23, 1865. *Senegal.*
3. **A. bimaculata**, Ad., Proc. Zool. Soc. p. 131, 1854.  
C. Ic. pl. 3, sp. 11. *New Caledonia.*
4. **A. brevis**, Sowb., Thes. ii, p. 469, pl. 101, f. 70, 71,  
1855.  
C. Ic. pl. 2, sp. 5. Coq. Viv. p. 12, pl. 3, f. 3. *Australia.*

\* I agree with Mr. Tryon in his statement in the Am. Jour. Conch., Vol. i, p. 95, and consider the genus *Simnea*, Risso, as a synonym of *Amphiperas*, Gron. The two species referred to it, viz., *S. aperta*, Sowb., and *S. patula*, Pennant, are undoubtedly young shells.

The former closely resembles *V. birostris*, jun., Linn., and has been placed in its synonymy, and the latter, *A. patula*, with *A. Adriatica*, Sowb., as its synonym.

5. **A. bulla**, Ad. and Rve., Mol. Voy. Sam. p. 21, pl. 6, f. 5, 1850.  
C. Ic. pl. 5, sp. 20. *China Seas.*
6. **A. bullata**, Ad. and Rve., Mol. Voy. Sam. p. 23, pl. 6, f. 13, 1850.  
C. Ic. pl. 6, sp. 26. *Singapore.*
7. **A. carnea**, Poiret, Voy. En. Barb. ii, p. 21, 1789.  
C. Ic. pl. 4, sp. 17. Coq. Viv. p. 10, pl. 6, f. 2. Thes. ii, p. 471, pl. 101, f. 74, 77. *Mediterranean Sea.*
8. **A. concinna**, Ad. and Rve., Mol. Voy. Sam. p. 22, pl. 6, f. 8, 1850.  
C. Ic. pl. 5, sp. 21. Thes. ii, p. 461, pl. 101, f. 86, 87. *Philippines.*
9. **A. dentata**, Ad. and Rve., Mol. Voy. Sam. p. 21, pl. 6, f. 4, 1850.  
C. Ic. pl. 8, sp. 36. Thes. ii, p. 473, pl. 101, f. 101, 102. *Caramenta Passage.*
10. **A. dorsuosa**, Hinds, Mol. Voy. Sul. p. 47, pl. 16, f. 3, 4, 1844.  
C. Ic. pl. 6, f. 27. Thes. ii, p. 473, pl. 101, f. 97, 98. *Straits of Malacca.*
11. **A. frumenta**, Sowb., Spec. C. pt. 1, p. 7, f. 3, 1830.  
C. Ic. pl. 6, sp. 25. Coq. Viv. p. 20, pl. 6, f. 5. Thes. ii, p. 474, pl. 101, f. 103, 104. *Hab.—?*
12. **A. frutica**, Ad., MSS. C. Ic. pl. 4, f. 16, 1865. *Malacca.*
13. **A. lactea**, Lam., An. sans Vert. vii, p. 368, 1822.  
C. Ic. pl. 1, f. 1. Coq. Viv. p. 8, pl. 6, f. 1. Thes. ii, p. 468, pl. 101, f. 67—69. *Philippines.*
14. **A. margarita**, Sowb., Thes. ii, p. 469, pl. 101, f. 93, 94, 1855.  
C. Ic. pl. 3, sp. 10. Coq. Viv. p. 11, pl. 6, f. 4. *Philippines.*
15. **A. marginata**, Sowb. (*non* Adams), Spec. C. pt. 1, p. 5, f. 15, 16, 1830.  
C. Ic. pl. 2, sp. 8. Coq. Viv. p. 7, pl. 3, f. 1. *Hab.—?*
16. **A. nuberculata**, Ad. and Rve., Mol. Voy. Sam. p. 23, pl. 6, f. 12, 1850.  
C. Ic. pl. 3, sp. 12. Thes. ii, p. 471, pl. 101, f. 80, 81. *Eastern Seas.*

- 17. A. ovum**, Rumph., Amb. Rarit. pl. 38, f. Q, 1705.  
*O. ovum*, Linn., Syst. Nat. p. 1181, 1767. C. Ic. pl. 1, sp. 3. Thes. ii, p. 467, pl. 99, f. 1—3.  
*O. alba*, Schum., Nouv. Syst. p. 258, 1817.  
*O. oviformis*, Lam., An. du Mus. xvi, p. 110, 1811. *Moluccas.*
- 18. A. patula**, Pennant, Brit. Zool. iv, p. 117, pl. 70, f. 85, 1777.  
C. Ic. pl. 7, sp. 30. Coq. Viv. p. 6, pl. 5, f. 4. Thes. ii, p. 479, p. 101, f. 105—113.  
*O. Adriaticum*, Sowb., Thes. ii, p. 470, pl. 99, f. 13, 14, 1855. *Torbay—Sicily.*
- 19. A. punctata**, Ducl., Guer. Mag. p. 7, pl. 7, f. 1, 1830.  
C. Ic. pl. 5, sp. 22. Coq. Viv. p. 13, pl. 5, f. 3. Thes. ii, p. 471, pl. 101, f. 90—92. *Isle of Bourbon.*
- 20. A. pudica**, Ad., Proc. Zool. Soc. p. 131, 1854.  
C. Ic. pl. 2, sp. 6. *New Caledonia.*
- 21. A. pyriformis**, Sowb., Spec. C. pt. 1, p. 5, f. 21—23, 1830.  
C. Ic. pl. 2, sp. 9. Thes. ii, p. 470, pl. 101, f. 72, 73. *New South Wales.*
- 22. A. pyrulina**, Ad., Proc. Zool. Soc. p. 131, 1854.  
C. Ic. pl. 4, sp. 19. *New Caledonia.*
- 23. A. rhodia**, Ad., Proc. Zool. Soc. p. 130, 1854.  
C. Ic. pl. 4, sp. 18. *Japan.*
- 24. A. scitula**, Ad., Proc. Zool. Soc. p. 131, 1854.  
C. Ic. pl. 6, f. 29. *New Caledonia.*
- 25. A. semistriata**, Psc., Proc. Zool. Soc. p. 241, 1862.  
C. Ic. pl. 3, sp. 13. Am. Jour. Conch. iv, p. 96, pl. 11, f. 16. *Sandwich I.*
- 26. A. striatula**, Sowb., Spec. C. pt. 1, p. 7, pl. 38, 1830.  
C. Ic. pl. 6, sp. 28. Thes. ii, p. 472, pl. 101, f. 84, 85. *Batanzas—Philippine I.*
- 27. A. tortilis**, Martyn, (*non* Desh.), Univ. c. pl. 60, 1782.  
C. Ic. pl. 1, sp. 4.  
*O. angulosum*, Lam., An. sans. Vert. vii, p. 367, 1822. Thes. ii, p. 467, pl. 99, f. 4, 5. Coq. Viv. p. 4, pl. 2, f. 1.  
*O. columba*, Schub. et Wag., pl. 228, f. 4043—4.  
*O. costellata*, Lam., An. du Mus. xvi, p. 110, 1810.  
*O. imperialis*, Dilw., Cat. p. 473, 1817. *E. Indies.*



28. **A. triticea**, Lam., An. du Mus. xvi, p. 111, 1810.  
 C. Ic. pl. 4, sp. 15. Thes. ii, 474, pl. 100, f. 20, 21. Coq.  
 Viv. p. 15, pl. 6, f. 3.  
*O. lepidula*, Dilw., Cat. p. 474, 1817.
29. **A. umbilicata**, Sowb., Proc. Zool. Soc. p. 135, 1848.  
 C. Ic. pl. 3, sp. 14. Thes. ii, p. 469, pl. 101, f. 88, 89.  
*Philippines.*

Genus **CALPURNUS**, Montf.

Conch. Syst., 1810.

1. **C. verrucosus**, Linn., Syst. Nat. p. 1182, 1767.  
 C. Ic. pl. 1, sp. 2. Coq. Viv. p. 5, pl. 2, f. 3. Thes. ii, p.  
 468, pl. 10, f. 78, 79. *Philippines.*

Genus **CYPHOMA**, Bolten.

1798, *teste* Ad. Genera 1, p. 271.

1. **C. emarginata**, Sowb., Spec. C. pt. 1, p. 7, f. 54, 55, 1830.  
 C. Ic. pl. 7, sp. 34. Coq. Viv. p. 18, pl. 3, f. 2. Thes.  
 ii, p. 479, pl. 99, f. 11, 12. *St. Elena.*
2. **C. gibbosa**, Linn., Syst. Nat. p. 1183, 1767.  
 C. Ic. pl. 7, sp. 32. Coq. Viv. p. 17, pl. 2, f. 2. Thes. ii,  
 p. 479, pl. 99, f. 15, 19. *West Indies—Coast of Brazil.*
3. **C. hordacea**, Lam., An. du Mus. xvi, p. 112, 1810.  
 C. Ic. pl. 8, sp. 37. Coq. Viv. p. 16, pl. 6, f. 6, 6\*. Thes.  
 ii, p. 473, pl. 101, f. 110—112. *E. Archipelago.*
4. **C. intermedia**, Sowb., Spec. C. pt. 1, p. 9, 1830.  
 C. Ic. pl. 7, sp. 33. Coq. Viv. p. 25, pl. 4, f. 2. Thes.  
 ii, p. 479, pl. 100, f. 61, 62. *Brazil.*
5. **C. Traillii**, Ad., Proc. Zool. Soc. p. 222, 1855.  
 C. Ic. pl. 8, sp. 38. *Malacca.*

Genus **VOLVA**, Bolten, 1798.

1. **V. acicularis**, Lam., (*non* Sowb.), An. du Mus. xvi, p. 102,  
 1810.  
 C. Ic. pl. 12, sp. 53. Thes. ii, p. 477, pl. 100, f. 43—46.  
 Coq. Viv. p. 21, pl. 5, f. 2. *W. Indies.*
2. **V. acuminata**, Ad. and Rve., Mol. Voy. Sam. p. 21, pl. 6,  
 f. 1, 1850.  
 C. Ic. pl. 8, sp. 35. Thes. ii, p. 276, pl. 100, f. 49, 50.  
*Eastern Seas.*
3. **V. æquale**, Sowb., Proc. Zool. Soc. p. 174, 1832.  
 Conch. Ill. Cat. Cyp. p. 18, f. 61. *Panama.*

4. **V. Angasi**, Ad., MSS. C. Ic. pl. 10, sp. 43, 1865.  
*Australia.*
5. **V. Antillarum**, Sowb., C. Ic. pl. 14, sp. 64, 1865.  
*W. Indies.*
6. **V. arcuatum**, Sowb., C. Ic. pl. 13, sp. 58, 1865.  
*Hab.—?*
7. **V. avena**, Sowb., Proc. Zool. Soc. p. 173, 1832.  
Conch. Ill. Cat. Cyp. f. 59. *St. Barbara—Panama.*
8. **V. birostris**, Linn., Syst. Nat. p. 1182, 1767.  
C. Ic. pl. 10, sp. 45. Thes. ii, p. 480, pl. 100, f. 65, 66.  
Coq. Viv. p. 24, pl. 5, f. 1.  
*O. brevirostris*, Schum., Nouv. Syst. p. 259, 1817.  
*O. aperta*, Sowb., Thes. 11, p. 478, pl. 101, f. 106, 107.  
*Singapore.*
9. **V. Borbonica**, Desh., Cat. Moll. I. Reunion, p. 136, pl. 13,  
f. 18—20, 1863. *Bourbon.*
10. **V. Californica**, Sowb., MSS., C. Ic. pl. 11, sp. 50, 1865.  
*California.*
11. **V. coarctata**, Ad. & Rve., Mol. Voy. Sam. p. 21, pl. 6, f.  
2, 1850.  
C. Ic. pl. 13, sp. 57. Thes. ii, p. 473, pl. 101, f. 108, 109.  
*Str. of Sunda.*
12. **V. deflexa**, Sowb., Proc. Zool. Soc. p. 136, 1848.  
C. Ic. pl. 12, sp. 56. Thes. ii, p. 478, pl. 100, f. 37, 38.  
*Ticao.*
13. **V. formicaria**, Sowb., Spec. C. pt. 1, p. 8, 1830.  
C. Ic. pl. 12, sp. 52. Thes. ii, p. 476, pl. 100, f. 47, 48.  
*Eastern Seas.*
14. **V. formosa**, Ad. & Rve., Mol. Voy. Sam. p. 22, pl. 6, f.  
6, 1850.  
C. Ic. pl. 8, sp. 39. Thes. ii, p. 474, pl. 101, f. 99, 100.  
*Borneo.*
15. **V. gracilis**, Ad. & Rve., Mol. Voy. Sam. p. 22, pl. 6, f.  
11, 1850.  
C. Ic. pl. 13, sp. 61. Thes. ii, p. 481, pl. 100, f. 51, 53.  
*Borneo.*
16. **V. Indica**, Sowb., C. Ic. pl. 11, sp. 47, 1865.  
*Bombay.*
17. **V. inflexa**, Sowb., Proc. Zool. Soc. p. 173, 1832.  
Conch. Ill. Cat. Cyp. p. 18, f. 60. *Gulf of Dulce.*
18. **V. lanceolata**, Sowb., Proc. Zool. Soc. p. 135, 1848.  
C. Ic. pl. 13, sp. 59. *Philippines.*

19. **V. livida**, Sowb., C. Ic. pl. 14, sp. 63, 1865. *Panama.*
20. **V. longirostrata**, Sowb., Spec. C. pt. 1, f. 46, 1830.  
C. Ic. pl. 9, sp. 40. Thes. ii, p. 481, pl. 100, f. 59, 60.  
Coq. Viv. p. 25, pl. 5, f. 5. *Adriatic Sea.*
21. **V. neglecta**, C. B. Ad., An. Lye. N. II. v, p. 255, 1852.  
C. Ic. pl. 14, sp. 62. *Panama.*
22. **V. Nicænsis**, Risso, Eur. Merid. iv, p. 235, f. 150, 1826.  
*Mediterranean Sea.*
23. **V. obtusa**, Sowb., Spec. C. pt. 1, p. 1, f. 34, 1830.  
C. Ic. pl. 7, sp. 31. Thes. ii, p. 475, pl. 100, f. 22—24.  
*China.*
24. **V. Philippinarum**, Sowb., Proc. Zool. Soc. p. 136, 1848.  
C. Ic. pl. 10, sp. 46. Thes. ii, p. 481, pl. 100, f. 57, 58  
*Philippines.*
25. **V. purpurea**, Risso, Eur. Merid. iv, p. 235, 1826.
26. **V. recurva**, Ad. & Rve., Mol. Voy. Sam. p. 21, pl. 6,  
1850.  
C. Ic. pl. 12, sp. 54. Thes. ii, p. 481, pl. 100, f. 54—56.  
*China Sea.*
27. **V. rosea**, Ad., Proc. Zool. Soc. p. 130, 1854.  
C. Ic. pl. 10, sp. 44. *China Sea.*
28. **V. rufa**, Sowb., Proc. Soc. Zool. p. 173, 1832.  
Conch. Ill. Cat. Cyp. p. 17, f. 58. *Caraccas.*
29. **V. secale**, Sowb., Spec. C. pt. 1, f. 36, 1830.  
C. Ic. pl. 14, sp. 66. Thes. ii, p. 475, pl. 100, f. 25—27.  
*Eastern Seas.*
30. **V. seminula**, Sowb., Spec. C. pt. 1, f. 40, 1830.  
C. Ic. pl. 11, sp. 48. Thes. ii, p. 475, pl. 100, f. 41, 42.  
*Friendly Islands.*
31. **V. similis**, Sowb., Proc. Zool. Soc. p. 136, 1848.  
C. Ic. pl. 11, sp. 49. Thes. ii, p. 475, pl. 100, f. 28, 29.  
*Hab.—?*
32. **V. spelta**, Linn., Syst. Nat. p. 1182, 1767.  
C. Ic. pl. 10, sp. 42. Thes. ii, p. 480, pl. 100, f. 63, 64.  
Coq. Viv. p. 22, pl. 5, f. 4.  
*Mediterranean Sea—Pacific Ocean.*
33. **V. subreflexa**, Ad. & Rve., Mol. Voy. Sam. p. 22, pl. 6,  
f. 10, 1850.  
C. Ic. pl. 12, sp. 55. Thes. ii, p. 480, pl. 100, f. 33, 34.  
*Bilaton.*

34. **V. subrostrata**, Sowb., Proc. Zool. Soc. p. 136, 1848.  
C. Ic. pl. 14, sp. 65. Thes. ii, p. 477, pl. 100, f. 39, 40.  
*Honduras.*
35. **V. uniplicata**, Sowb., Proc. Zool. Soc. p. 135, 1848.  
C. Ic. pl. 11, sp. 51. Thes. ii, p. 478, pl. 100, f. 30—32.  
*So. Carolina—Georgia.*
36. **V. variabilis**, C. B. Ad., An. Lyc. N. H. v. p. 255, 1852.  
C. Ic. pl. 13, sp. 60. *Cape St. Lucas.*
37. **V. volva**, Linn., Syst. Nat. p. 1182, 1767.  
C. Ic. pl. 9, sp. 41. Thes. ii, p. 482, pl. 99, f. 6—8. Coq.  
Viv. p. 26. pl. 4, f. 1. *Philippines.*

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1869-70.

PART 4.

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*Meeting Nov. 4th, 1869.*

Ten members present.

DR. RUSCHENBERGER, Director, in the Chair.

Donations to the Museum and Library were announced.

The following papers were offered for publication in the Journal, and referred to committees:

“Notes on West Coast Land Shells, No. 2.” By J. G. Cooper, M. D.

“On a new Californian Helicoid Land Shell.” By J. G. Cooper, M. D.

Mr. Tryon called attention to specimens of *Amnicola grana*, Say, from Carter Co., Missouri, presented to the Section by Mr. John Wolf, of Canton, Ills. This very minute species was apparently unknown to Prof. Haldeman, who, in his monograph of the genus, merely quotes Say's original description and citation of locality, and does not figure it. The species was for years considered a doubtful one, until Mr. Tryon had re-discovered it, some six or eight years since, in considerable numbers in ditches in the southern part of the City of Philadelphia, near League Island.

Specimens were sent to most of the prominent American Conchologists, many of whom informed him that it was new to their collections. The specimens presented this evening indicate that the species has a large area of distribution.

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*Meeting Dec. 2d, 1869.*

Seven members present.

DR. RUSCHENBERGER, Director, in the Chair.

Several donations to the Museum and Library were announced. The following papers were presented for publication :

"Descriptions of three new species of shells." By John Wolf.

"Notices and Reviews of new Conchological Works." By Geo. W. Tryon, Jr.

The Annual Reports of the Recorder, Secretary, Conservator, Librarian and Publication Committee were read. (See Appendix.)

The following gentlemen were elected to serve as Officers and Committees of the Section during the ensuing year :

#### OFFICERS.

DIRECTOR, . . .	W. S. W. RUSCHENBERGER, M.D.
VICE DIRECTOR, . .	GEO. W. TRYON, JR.
RECORDER, . . .	S. R. ROBERTS.
TREASURER, . . .	WM. L. MACTIER.
SECRETARY, . . .	REV. E. R. BEADLE.
CONSERVATOR, . .	E. J. NOLAN, M. D.

#### COMMITTEES.

1. <i>Library.</i>	7. <i>Terrestrial Mollusca, (operculate.)</i>
E. J. NOLAN, M, D., Librarian,	
C. F. PARKER,	JOHN H. REDFIELD, Ch'n,
GEO. W. TRYON, JR.	E. R. BEADLE,
	WM. L. MACTIER.
2. <i>Publication.</i>	8. <i>Fluviatile Gasteropoda.</i>
GEO. W. TRYON, JR., Editor,	C. M. WHEATLEY, Ch'n,
S. R. ROBERTS,	S. S. HALDEMAN,
E. J. NOLAN, M. D.	F. A. HASSLER, M. D.



3. *Finance.*

W.S.W. RUSCHENBERGER, C'h'n, ISAAC LEA, Ch'n,  
 W. S. VAUX,  
 W. P. WILSTACH.

9. *Fluviatile Acephala.*

WM. L. MACTIER,  
 CHAS. M. WHEATLEY.

4. *Embryology and Anatomy.*

JOS. LEIDY, M. D., Ch'n,  
 E. D. COPE,  
 S. B. HOWELL, M. D.

10. *Marine Gasteropoda.*

S. R. ROBERTS, Ch'n,  
 C. F. PARKER,  
 JOHN FORD.

5. *Cephalopoda, Pteropoda and Brachiopoda.*

S. B. HOWELL, M. D., Ch'n,  
 T. A. CONRAD,  
 GEO. W. TRYON, JR.

11. *Marine Acephala.*

T. A. CONRAD, Ch'n,  
 JOHN S. PHILLIPS,  
 SAM'L. LEWIS, M. D.

6. *Terrestrial Mollusca, (non-operculate.)*

WM. G. BINNEY,  
 C. F. PARKER,  
 C. W. PEALE.

12. *Palæontology.*

T. A. CONRAD, Ch'n,  
 W. M. GABB,  
 E. D. COPE.

13. *Lectures and Prizes.*

JOSEPH LEIDY, M. D., Ch'n,  
 W. S. W. RUSCHENBERGER, M. D.,  
 ISAAC LEA.

## ON A NEW CALIFORNIAN HELICOID LAND SHELL.

BY J. G. COOPER, M.D.

DÆDALOCHILA HARFORDIANA, Cooper.—Plate 17, fig. 8.

*Sp. ch.* D. testa lævi, discoidea, planulata, translucente, luteo-corneâ; anfr. 6, superne planatis, lente accrescentibus, ult. antice breviter deflexo; umbilico lato, ad apicem pervio, anfr. 5-monstrante; apert. obliqua, lunato-ovali; perist. superne depresso, albo, incrassato, dentibus duobus inflectis, uno supra medium parietis externi, altero basali; marginibus callo valido junctis; dente crasso triangulari in medio parietis interni, oblique inflecto, subhorizontaliter sito; diam. maj. 0.40, min. 0.35, alt. 0.16 cent. poll. Angl.

*Animal* albidum, dorso tentaculisque oculiferis nigris, pede longo postice cuneiformi.

*Hab.*—Fresno County, California, in sylvis Big Trees dictis, alt. 6500 ped. Angl. supra mare, lat. 37° N. Invenit beatus W. G. W. Harford.

*Specific characters.*—Shell smooth, discoid, flattened, translucent, yellowish corneous; whorls six, flat above, slowly increasing, the last a little deflexed near the end; umbilicus broad, pervious to the apex, showing five whorls; aperture oblique, lunate-oval; peristome depressed, white, thickened, with two inflected teeth, one above the middle of the external wall, the other basal; margin joined by a thick callus; a strong triangular tooth on the middle of the body-whorl; obliquely inflected and nearly horizontal; diam. maj. etc.

*Animal* white, the back and eye-bearing tentacles black, foot long, posteriorly wedge-shaped.

*Remarks.*—This is the first of the genus found in California, and is very interesting in many particulars. Above and beneath it almost exactly resembles *D. polygyrella*, Bld. and Cp.,

excepting a flatter and smoother upper surface, one whorl less, and a slightly narrower umbilicus. It has, however, no trace of internal teeth, as proved by an immature specimen; the parietal tooth differs in form, and it has two labial teeth situated as in *Triodopsis*. These connect it with *D. Behrii*, Gabb, of Guaymas, which has only five whorls, stronger teeth and a non-pervious umbilicus, showing but  $1\frac{1}{2}$  whorls.

The animal does not differ externally from that of *Triodopsis loricata* from the same region, except that this is black.

The great altitude at which this is found is remarkable for the genus, as snow falls there several feet deep. It is interesting also in connection with the occurrence of the allied *polygyrella* in lat.  $47^{\circ}$  and alt. about 3000 feet. Its chief distribution is probably more southern, as only two were found, one immature.

## DESCRIPTIONS OF THREE NEW SPECIES OF SHELLS.

BY JOHN WOLF.

VERTIGO TRIDENTATA, Wolf. Plate 17, fig. 1.

*Description.*—Shell narrowly ovate, amber-colored, highly polished; whorls 5, smooth, with three teeth in the mouth, one on the middle of the lower lip and one on each side, forming a regular triangle.

Canton, Illinois.

Abundant in shady copses on green weeds, climbing as high as three feet from the ground. I collected 12,000 from standing weeds and not one from the ground, although it was searched well to find them.

PYRGULA SCALARIFORMIS, Wolf. Plate 17, fig. 3.

*Description.*—Shell turritid, slender; whorls 6, chalky white; suture deeply impressed; carinate its entire length on the lower edge of the whorls; mouth small, ovate, but slightly connected with the last whorl. Length  $\frac{5}{10}$ ths of an inch.

Post Pliocene: abundant on the Tazewell shore of the Illinois River.

This is the first American species of the genus.

LIMNEA TAZEWELLIANA, Wolf. Plate 17, fig. 2.

*Description.*—Shell turritid, slender; whorls 7, convex; suture deeply impressed, umbilicate; mouth elliptical, small. Length  $\frac{3}{8}$  of an inch.

Post Pliocene, Tazewell side, Illinois River.

Allied to *L. caperata*, Say, but more slender and turritid.

## NOTES ON WEST COAST LAND SHELLS.

## No. II.

BY J. G. COOPER, M. D.

The last article by me on this subject, published in Vol. IV. Part 4, p. 211, gave a sketch of the distribution of Helicoid land shells as known to me up to August, 1868, with some notes on other relations of the species.\*

I now propose to give such additional information on all the land shells as has accumulated since the writing of previous articles.

My synopsis in the Proc. Cal. Acad. Sciences, Sept., 1867, gave 55 species of Helicoid shells west of the Rocky Mountains, between latitudes 49° and 33° north. I can now add two new species from Nevada and Utah, two from California (one of a new genus), two more new to this State, and also define five well-marked varieties or subspecies. The recent annexation of Alaska has also added one or two to the west-coast fauna, besides a *Vitrina* and a *Zua*, first enumerated as such by R. E. C. Stearns in the Proc. Cal. Acad. iii, 384, and published May, 1868. A new Californian *Leucocheila* is also indicated.

The measurements here given are in hundredths of an inch, as in my Synopsis.

Additions to the west-coast list since 1867 have their names printed in small capitals.†

With respect to the classification of mollusca by characters derived wholly from their soft parts or the internal organs, I may remark that too much importance seems to be attached to

\* Previous papers by me, relating to them, are, the "Geographical Catalogue of West Coast Mollusca," April, 1867, and others in Proc. Cal. Acad. Sciences, vol. ii, pp. 62, 259, 294, 331.

† The map accompanying the article on Distribution in Vol. IV was engraved without my seeing a proof, and the artist has omitted most of the reference marks given in the explanation on p. 238. A close attention to the account of localities, etc., will, however, generally make up for this unfortunate omission.

their being herbivorous, carnivorous or omnivorous, as shown by the lingual dentition or jaws, since it is well known that these divisions are characteristic chiefly of the higher animals of each class. Many land species feed on fungi which are nearly as much animal as vegetable in nature, and nearly all devour each other when starving.

As to the caudal mucous gland, it is certainly of much less importance than the shell, and if made the basis of some family divisions, why not found all the families on the mucous glandular system only?

*Succinea Stretchiana*, Bland. Specimens found by Harford and Dunn at Clark's Ranch, near the forks of Merced river, Mariposa Co., at 4270 feet elevation, are more elongated than the type figured, resembling small specimens of *Oregonensis*, Lea. Its first discovery west of the Sierra Nevada.

*Succinea Sillimani*, Bland. Found at Stockton by Mr. Dunn, and at Marsh's Ranch, east of Mt. Diablo, by Mr. Rowell, not rare. Small ones are very like *S. Nuttalliana*, Lea, which has before been reported from San Joaquin valley. Before found only at Humboldt Lake.

*Succinea lineata*, W. G. Binney. Bleached specimens from near Salt Lake City found by Dr. Beraz, cannot be distinguished in form from the above, but show no spiral lines. They are uncommonly heavy.

#### VITRINA PELLUCIDA, Müll. ?

Whorls 3, greenish, spire more elevated, but base flatter than in *V. Pfeifferi*; diam. 0.20, axis 0.05, alt. 0.075. Lower and broader than *V. angelicæ* or *limpida*.

Specimens brought from Ounalaska by Mr. Harford differ as above from both the western form and the eastern *V. limpida*. Although smaller than most European specimens, they appear to agree otherwise, and Middendorff gives that species as circum-polar (Sibiriens Reise, pp. 273—308, 1851). He also mentions *Succinea putris*, but no species of the genus has been found in Alaska recently. According to Mörch, he includes *S. Grænlantica*.\*

*Vitrina Pfeifferi*, Newc. Has been found by Mr. C. D. Voy in Shasta Valley, Siskigon Co., and in Klamath Co., at 6000 feet elevation on Coast Mts. Also by Mr. Harford at Big Tree Meadows, Mariposa and Fresno counties, about 6500 feet high.

\* This Journal, iv, p. 31.



*Binneya notabilis*, Cp. The colored copies of Mr. Tryon's Monograph represent the white mucous summer envelope as colored, instead of the figure of the animal in motion. I made a careful colored drawing of it when alive, which may yet be published.

*Hyalina arborca*, Say? Given in the Geograph. Catal., but accidentally omitted in the Synopsis. Numerous specimens found by Harford and Dunn at Clark's Ranch differ from New York examples only in being slightly higher, and flatter beneath, but the range of variation in this species is enough to include them. I found a few in rotten stumps west of Johnson's Pass, lat. 39°, at an elevation of 3650 to 5000 feet (this Journal, iv, p. 226), but confounded them with *H. Breweri*, supposing the difference due to difference of station, the latter living on sticks in open swamps.

*Hyalina Breweri*, Newc. Specimens found by me at Hunter's Point, San Francisco Co., differ from the types from near Lake Tahoe only in being smaller and flatter. Having found them inside dead shells of *A. arrosa*, I suspect that they sometimes devour the dead animals of the large species. The *Binneya*, having a shell like *Testacella*, may also be found hereafter in dead snail shells.\*

*Conulus fulvus*, Drap.? The specimens brought by Harford from Ounalaska and Sitka were referred by Stearns to this instead of *C. chersinus*, Say, supposing them the same. Middendorf also calls it circumpolar, but I have none for comparison.

#### PSEUDOHYALINA MAZATLANICA, Pfeiff. (Tryon.)

Whorls 4, larger, smoother and less elevated than *P. conspecta*, Bld. Diam. 0.10, axis 0.03. (The larger diameter given by me in the Synopsis belongs to this species.) My attention was first called to the difference in the two by Rev. J. Rowell. Both occur together in rotten oak stumps near San Francisco (Lone Mountain).

*Ps. milium*, Morse. Pronounced identical with his species by Mr. Morse, though I could not detect "revolving grooves" in our specimen with the highest magnifiers.

\**Hyalina pura*, Alder, is given by Middendorf as circumpolar, but the species has not yet been detected in Alaska as far as known. *Vallonia pulchella*, Müll., is also given by him, perhaps confounding *V. minuta*, Say, from the American side. The minute circumpolar genera may have migrated from one continent to the other, but the higher Helicoids of the temperate zone could not, during the present forms of the continents.

## PATULA RUDERATA, Studer?

Whorls 4, dark corneous brown, subdepressed, umbil. moderate, growth-ribs strong; diam. 0.20, height 0.12. Narrower than *P. striatella*, much rougher, and higher in proportion; umbil. narrower and color darker. Specimens from Ounalaska, brought by Harford, were referred doubtfully to this species, which is given by Middendorf as Siberian. They differ from Gould's "*H. pauper*" of Japan, which he supposes to be the Siberian "*ruderata*," but I have none of the latter for comparison.

*P. striatella*, Anth. The elevation given in my Synopsis as 0.15 should be 0.10. *P. Cronkhitei*, Newc., found only near Klamath Lake and Mt. Shasta, is more strongly ribbed, flatter, and almost subcarinate in the periphery.

"*HELIX HAYDENII*," Gabb (this Journal, v, p. 24), appears from the description to be of the same group as *Idahoensis* (*Anguispira*?). "*Helix Hemphillii*," Newc., allied to *Cooperi*, has, I learn, been lately described from White Pine, Nev.

## AMMONITELLA YATESII, Cp.

The figures in Amer. Jour. of Conchology (vol. iv, part 4, pl. 18, f. 1, 2, 3) are incorrect in being reversed, having been copied from the necessarily reversed drawing made by me on wood. The smaller one is also distorted, and the enlarged one of the mouth made angular instead of uniformly rounded.

Another dead specimen has been received from the same cave by Mr. H. P. Carlton.

Genus *HELIX*, Linn.

Although H. and A. Adams, like others, give *pomatia* as the type of this genus, it cannot strictly be considered so since the division of the Linnean genus, unless he used it as such in some work published before 1760, for the *Systema Naturæ* makes the first section of the genus consist of species "angulated on both sides" (including *Planorbis* and such forms). That genus having been previously named by Guettard, must be eliminated, and then the first terrestrial species described is *H. cornu-militare*, which thus becomes the type of the genus. It has been put in *Helicogena*, Fer., *Eurycratera*, Beck, and *Liostoma*, Sw. (teste Jay's Cat.), but the law of priority seems to demand its restoration to the head of the genus and family.\*

\* Since writing the above I have received this Journal, Vol. iv, Part 4, in which my inquiry, "What is the type of *Helix*?" is partly answered by Mr. Tryon by saying that in the 12th Ed. of the Syst. Nat. the first species under *Helix* belongs to *Scarabus*, the second is *lapicida*. He

To use *Helix* for all Helicoid species collectively, as is done now by many even eminent authors, is quite inadmissible by the rules of scientific nomenclature, even when the vast group thus included is divided into numerous subgenera. These should properly be called genera, at least in most cases, even when the differences depend only on characters of the shells.

If some one having the authorities at command will publish a table of all the generic names ever given to them, with the date of each, and name of first species, or of any other specified as type, it is probable that nearly all may yet become of use in making classifications or arranging cabinets. Our species certainly do not belong to *Helix*, and it is necessary to use some other generic names for them. For *Aglaia* (thrice preoccupied) H. and A. Adams use *Lysinoe*, of which the type seems to be *L. Ghiesbreghtii*, Nyst, of Mexico, very much like *fidelis*.

*Arionta* (*arbustorum*), though differing from the nearest allied of our species in its contracted mouth and want of rough sculpture, is near enough to be used for them until distinctions are found in the animals.

At the time of writing the Synopsis of West Coast Helicoid Land Shells, I had not seen Mörch's articles in the Journal de Conchyliologie for 1865. Mr. Bland has called my attention to them, and I find that my mode of grouping the species is confirmed by that eminent authority, whose remarks I quote as briefly as is consistent with the nature of the subject:

"1st. The form of the lip is important chiefly as a generic character. The teeth are specific only (but form good subgenera among American species).

"2d. The umbilicus, very variable according to the shell's age, has scarcely even a specific value.

"3d. The color, number, and position of the *bands* have, contrary to all expectation, a systematic and generic value of the first rank, being always in relation with the form of the jaws and darts."\*

then says that Lamarck's first *Planorbis* is an *Ampullaria*, apparently forgetting that Guettard founded the genus before Linnæus, who merged it in *Helix*. This, therefore, does not prevent us from adopting the first terrestrial *Helix* of Linn. as the type, whether given in the 12th Ed or previously. Unfortunately I cannot refer either to his Museum Ulricæ or to Hanley's Linn. Conch., which may clear it up. Even his first writings in which the name *Helix* occurs may have to be consulted to settle the point.

\* Mörch finds the angled, umbilicated *Chilotrema lapicida* closely allied to the 3—4-banded, sometimes hirsute and angled group of *Campylœa cingulata*, *trigona*, *setosa*, etc., which seem very like our *Anguispira*? *solitaria*, *Cooperi*, and *strigosa*. "*Lapicida* sometimes has four bands like its allies." It is not very distantly related to *A. arbustorum*, but less nearly to *Hygromia rufescens*, &c.

No laws of climatology will account for all the differences observable in the various forms I include in these two genera. Pale or colorless specimens may be caused by deficient food or moisture, and dwarfs or thin shells by cold or absence of lime; but we find ours, though nearly allied, preserving their characters under the same circumstances where several live in the same locality. The following table gives at one view the several species and varieties, with their chief characteristics, differing from the Synopsis only as more recent examinations require amendments. Explanatory notes follow, giving the reasons for these amendments. The Sections were first used by me in the article in Proc. Cal. Acad. Sci. 1866, p. 259, and correspond to the Groups of the Synopsis, 1867, p. 331.

In all our *Ariontas* I have examined I find 4—6 ribs on the jaw, as in *arbustorum* (Albers). In *Lysinoe mormonum* and *facta* I find 8!

### LYSINOE.

#### § A (= Gr. XIII).

Shining, smooth, or with revolving grooves; band usually light-margined.

*a. Whorls 7 to 8, colors mostly dark.*

1. *L. fidelis*, Gray.
2. *L. Dupetithouarsi*, Desh.
3. *L. Ayresiana*, Newc.

*b. Whorls 5—6½, paler, band often single in No. 7.*

4. *L. Traskii*, Newc.
5. *L. Remondii*, Tryon?
6. *L. rufocincta*, Newc.
7. *L.* (var. ?) *Gabbi*, Newc.
8. *L. facta*, Newc.

*Whorls 4½.*

*L. Remondii*, Tryon (type).

#### § B (= Gr. XIV).

Young hirsute and subangled, adult often rounded, grooves faint or none, bands hidden in young, obsolete in No. 9.

*a. Whorls 6 to 6½, dark.*

9. *L. infumata*, Gld.
10. *L. sequoicola*, Cp.
11. *L. mormonum*, Pf.
12. *L. Hillebrandi*, Newc.

*b. Whorls 4 to 4½, pale.*

13. *L. Rowellii*, Newc.
14. *L.* (var. ?) *Lohrii*, Gabb.

## ARIONTA.

## § C (= Gr. X and XI).

Dull brown or yellow, rugose, wrinkled or malleated, band pale-margined in young, often single in adult.

## a. Whorls 7 (6 in No. 2).

1. *A. arrosa*, Gld.
2. *A.* (var. ?) *arboretorum*, Val.
3. *A. exarata*, Pf.
4. *A.*? *Diabloensis*, Cp.

## b. Whorls 5 to 6½.

5. *A. Nickliniana*, Lea.
6. *A.* (var. ?) *Bridgesii*, Newc.
7. *A.* (var. ?) *nemorivaga*, Val.
8. *A. ramentosa*, Gld.
9. *A.* (var. ?) *reticulata*, Pf.
10. *A. tudiculata*, Binn.
11. *A. Californiensis*, Lea.
12. *A.* (var. ?) *vineta*, Val.
13. *A.* (var. ?) *redimita*, Binn.

## § D (= Gr. XII).

Brownish or variegated, smooth, with revolving grooves, band single, often obscure or none in adult; subimperfurate.

## a. Whorls 5 to 6.

14. *A. Kellettii*, Fbs.
15. *A.* (var. ?) *Stearnsiana*, Gabb
16. *A. intercisa*, W. G. B.
17. *A.* (var. ?) *crebristriata*, Newc.
18. *A. Carpenteri*, Newc.
19. *A. Tryoni*, Newc.

## LYSINOE, H. &amp; A. Adams.\*

*L. Traskii*, Newc.? A dwarfed, very thin variety, showing want of lime and heat, was found common by Harford and Dunn last year between 5000 and 6000 feet elevation, in Mariposa Co. It has but 4½ whorls, and diam. 0.75, axis 0.30 inch, but the form and faint revolving grooves distinguish the species, especially from other specimens of *A. tudiculata* of similar size found with these, while the light corneous hue and height indicate that it is not *L. mormonum*. It may be a thin northern variety of *L. Remondii*, but does not agree with the specimens determined as *Carpenteri* by Dr. Newcomb, though I am informed by Mr. Harford that Dr. Newcomb calls these by that name. In flattened spire and rounded base many of them approach nearer to *L.*? *Rowellii* or *Lohrii*.

*L. REMONDII*, Tryon.

This is to be added to our fauna if the specimens from the peninsula and San Diego are really the same as the Guaymas

\* Several authors describe *L. fidelis* as red-banded, but the band is really black, with red or yellow margins, that above often masked by the pale color of the upper surface.



shell. The larger size and possession of one to two more whorls make it, however, somewhat doubtful, as we find the number usually very constant in dwarfs of other species. The type is much more globose than the form of *Traskii* (?) just mentioned.

*L. Mormonum*, Pf. The bristle-marks seen on the first whorls in young specimens of this shell are not always perceptible, even in those living. I have, however, found some with both these and fine revolving grooves as in most others of § A. It connects this with § B, not only by the bristles but by the angled form of many specimens, running into *L. Hillebrandi*, *L. infumata*, Gld. The angled and black specimens of *fidelis* found at Humboldt Bay are probably hybrids with this, as Mr. Gabb has found it there. (Vol. IV, p. 224, note.)

*L. ? Rowelli*, Newc. I have removed this from Group XII, placing it doubtfully in § B, as the type showed only faint marks of bristles which were possibly erosions, and Mr. Gabb in Vol. IV, p. 235, contradicts his statement made in Vol. III, p. 236, that the shell of *Löhrii* shows "minute punctations, as if the live shell were hirsute," because he has since "seen fresh specimens." Yet both statements may be correct, as in *L. mormonum* the bristle-marks are visible only in very young or quite unworn shells. *L. ? Lohrii* may be the peninsular representative of *Rowelli*, which was more probably from Sonora, Mex., than "Arizona," thus removing both from the proper Californian list. They seem to be the subcarinate allies of the forms of *Remondii*, found living with or near them, although varying from the similar instances observed in § B, *a*, in relation with § A, *a*, *b*.

#### ARIONTA, Leach.

*A. arrosa*, Gld. The var.  $\beta$ . of W. G. Binney (Proc. Philad. Acad. N. S., Oct., 1857,) is only a dwarfed form, common on the cold treeless peninsula of San Francisco, and still smaller in dry localities in Napa Co., having the typical seven whorls but proportionally more elevated. The form mentioned by me in a foot note to the "West Coast Helicoids," as resembling *Pomatia* in form, and in this Journal, vol. IV, p. 222, as approaching *tudiculata*, deserves more special mention.

It appears to be the form figured by Valenciennes and copied by W. G. Binney, as *Helix arboretorum*, which has usually been considered a var. of *Nickliniana*. The figure is brownish-yellow, dotted as if malleate or indented, and seems umbilicate; band single, diam. 1.05, axis 0.68, alt. 0.92, (I give both the *axis* of the spire, and the altitude of apex above the general plane of the base, as these differ in many species, and it is often difficult



to know which the author means by "height," in descriptions). The Mendocino specimens are much larger, but similarly shaped and swollen in the body whorl. Some measure, diam. 1.20, axis 0.70, alt. 0.90.

Dr. Newcomb, in this Journal, I, p. 343, gives four "varieties of *Nickliniana*," of which *a* seems to be this, though it may be a hybrid of the two species, ("from Santa Cruz Co.") His varieties, *b.* and *d.*, are perhaps the true *Nickliniana* and var. *nemorivaga* to be mentioned hereafter.

*A. exarata*, Pf., 1857. Specimens obtained by H. P. Carlton near the head of S. F. Bay in damp meadows, are nearly all damaged by the annual fires, but good ones differ from those of Santa Cruz in being smoother, and the wrinkles more reticulate, lips less developed and color paler, agreeing well with Pfeiffer's description. I collected specimens in the same locality in 1855, which may have been Pfeiffer's types, perhaps sent through Mr. Bland. So little were the west coast forms then known that my father could only consider them, from published descriptions, a var. of *L. Dupetithouarsi*!

A subfossil specimen found by Mr. Rowell near Cape Mendocino, is apparently of this species, and though of good size has only 6 whorls, the number found in a very small fossil specimen from Santa Cruz. I have one from the latter place of uncommon large size, (the extreme given in my Synopsis), which may be a hybrid between this and *A. arrosa*, being also darker colored than usual.

*A. ? Diabloensis*. This form, named by me in this Journal, IV, p. 221, still remains unique, though I have young specimens from "the crossing of the Salinas river, Monterey Co., which look like it. Its resemblance to *L. mormonum* makes its position uncertain, and it may prove a hybrid.

*A. Nickliniana*, Lea, 1839. "Whorls 5, umbilicus small, yellowish-brown, band single, granulated; diam. 0.90, alt 0.70 inch." These are the essential characters of Lea's description, which was probably intended to represent the average size of his specimens, but his figure is much larger, having diam. 1.05, axis 0.58, alt. 0.70. Tryon's figure, probably from the same specimen, measures the same, but he gives the size in the text as in Lea's description, adding one whorl (6), the number five being undoubtedly an error. I think that the figures and descriptions belong to the marked varieties, of which the smaller may be called

*C. nemorivaga*, Val. It is represented in Dr. Binney's plate as

the typical *Nickliniana*, and is the commoner form near San Francisco, nearly or quite imperforate, yellowish or brown, diam. (of Val's. figure) 0.90, axis 0.55, alt. 0.70, whorls  $5\frac{1}{2}$ ; pale margins of the band usually visible.

Dr. Newcomb considered this the typical form, in describing *H. Bridgesii* and his var. *a*, "double the normal size." Others are intermediate between this and the large var., while one from Napa Co. measures only diam. 0.58, axis 0.48. The large var. is rare near S. F. Bay, and the best I have seen were from Bodega, where Nuttall probably obtained the type in 1835, as he sailed along the coast in a trading vessel, touching at the few points then inhabited by white men.

*C. Bridgesii*, Newc., 1861. Differs from the larger form of *Nickliniana* figured by Lea and Tryon, only in being "grayish corneous, thinner, band broader, umbil. wider (?); diam. 1.00, alt. 0.73." Tryon's figure, though "from a type," is smaller, diam. 1.00, alt. 0.62, but seems the same. It is the variety found east of S. F. Bay, in a warmer and drier climate than the type. Dr. Newcomb compares it to *ramentosa*, which seems to hybridize with it but is quite distinct. The sculpture is similar but fainter, and like Lea's type it may be called "granulated." The wrinkled epidermis found in many specimens of *Nickliniana* from near the coast, seems caused by a thickening of the surface obscuring the normal reticulate granulation, which is usually found on the upper whorls and in young specimens. I mentioned it in the Synopsis as a specific character of *Nickliniana*, but it is not constant, and the types do not seem to have shown it. Var. *Bridgesii* always shows the pale margins to band.

*A. ramentosa*, Gld., 1856. The typical small form, figured by Tryon, with  $5\frac{1}{2}$  whorls, is found chiefly on Mare Island, near Benicia.\* Some specimens show two narrow dark lines above and two below the pale margined band. Those from southward of there are larger, with one more whorl but the same form. Those approaching *Bridgesii* are much more elevated.

*C. reticulata*, Pf., 1857. This is doubtless merely a thickened variety in which the band becomes single, the pale margins disappearing, and the file-sculpture stronger. The color is described as yellowish, that of *ramentosa* reddish, but intermediate shades are found, the thinnest being darkest, as in the varieties of *Nickliniana*. Yates has brought specimens from Mission Peak, Alameda Co. exactly like *reticulata* but larger, together with numerous typical *ramentosa*. Mr. Carlton, however, dis-

\* Dr. Newcomb sent Gould the types from Benicia.

covered a small colony on the "Potreso," a point four miles from San Francisco, and on the west side of the bay, which may have furnished the type of this form, being small and exhibiting its characters more or less strongly.

*A. tudiculata*, Binn., 1843. This species, the only one in the Sierra Nevada, has great extremes of variation in size, occlusion of umbilicus and elevation, but the normal number of whorls,  $5\frac{1}{2}$ , with more or less of the malleated sculpture, are always perceptible. Those found by Voy, in Nevada Co., at about 3500 ft. elevation, measure, diam. 0.86, axis 0.42. Except in being slightly malleate instead of reticulated, they are scarcely distinguishable from the specimens of *ramentosa* from the Potreso near San Francisco. A few of a still smaller variety, with the umbilicus nearly closed, were found by Harford and Dunn with the dwarf *L. Frankii* in the mountains of Mariposa; diam. 0.70, alt. 0.38. This form still has  $5\frac{1}{2}$  whorls and approaches nearer *Carpenteri* as described, than the other form found there though still far smaller and lower in proportion, without revolving grooves.

In explanation of the reference of this species to the Columbia river in my father's report on the shells in Pacific R. R. Rept., vol. XII, part 2, 1859, I think poor specimens of *arrosa* were found by me near Santa Clara, Cal., in 1855, which might easily have been mistaken for the former, the description of the latter (subnom. *æruiginosa*) not having been seen. Dr. Gould himself apparently confounded them at first, as he gives *tudiculata* as collected in "Oregon," by the U. S. Expl. Exped., which did not explore this coast south of Monterey, though possibly they might have found it in the Northern Sierra Nevada. (Brit. Assoc. Rept. 1856, p. 211). In his description of *æruiginosa* he points out the differences between the two, (Feb. 1855).

*A. Californiensis*, Lea., 1839. The original type figured is evidently not the Monterey shell, but the northern form mentioned by me in this Journal, IV, p. 222, 224, and referred by Dr. Newcomb to *Californiensis* before he saw the Monterey form. Lea's figure measures, diam. 0.85, axis 0.50, alt. 0.60. The description gives diam. 0.70, alt. 0.60, but as in *Niekliniana* was apparently drawn from a smaller specimen than that figured, and not very accurately measured either. It is rare near San Francisco Bay and extends north to Klamath Co., (Voy.)

*A. vineta*, Val. This is the Monterey shell, which seems to have been considered a more perfect form of the preceding by the Binneys, who figure it under that name. It is much more convex above and below, measuring, diam. 0.90, axis 0.60, alt.

0.80. Many specimens even appear higher than wide, which is not the case with any other of the group. Whorls 5 to  $5\frac{1}{2}$ .

*A. redimita*? W. G. Binn., 1857. This form connects the last with var. *nemorivaga*, Val., differing from both in being obliquely depressed, so that the mouth approaches the horizontal position, and from the last in being quite imperforate and the band not edged with paler color. Whorls 6, imperforate, thin, granulated, reddish-brown, body-whorl swollen; diam. 0.80, axis 0.48, alt. 0.55, are the essential characters of the description. I have found the most typical specimens at Santa Cruz, but  $5\frac{1}{2}$  is the usual number of whorls. It perhaps ought to be considered rather a var. of *Nickliniana*, as it was by Dr. Binney, but that is always perforate.

A similar variety of *crebristriata*, Newc., is found on Clemente I., being in fact the thin form of which the thick, rough, and obscurely banded types are an extreme. Mr. Binney in letters identified this with *redimita*, but it has the spire more or less mottled and the faint revolving grooves usually perceptible.\*

The nine forms included in § C, *b*, are thus seen to graduate insensibly into each other excepting *tudiculata*, which, however, has varieties imitating nearly all the others. They approach nearer *Arionta arbustorum* than § C, *a*, which have more of the form of *Lysinoe*, with the colors and sculpture of the others. I find their jaws agree with that of *Arionta*, but each distinct.

The locality, "San Diego," given by Dr. Lea for *Californiensis* and *Nickliniana*, was no more incorrect than many others furnished by Nuttall, but may in part have arisen from his having found imperfect specimens of *Kellettii* and *tudiculata*, these, which at that time would naturally be considered varieties of the more perfect shells from near San Francisco Bay. Dr. Binney gives "Sacramento river, U. S. Expl. Exped.," with *Nickliniana*, but the only species found near its banks are *ramentosa* and *tudiculata*.

*A. Kellettii*, Fbs., 1850. Forbes' locality "San Juan del Fuaco," (see Brit. Assoc. Rept., 1856, p. 239), confounded by some with the Straits of Juan de Fuca, and by others with a

\* As Mr. Binney insists on the identity of *redimita* with the shell from Clemente Island, although I am not fully satisfied of it, there is no need of retaining the name for the San Francisco form, so called, as the latter is scarcely a variety of *nemorivaga*, Val., and both are forms of the true *Californiensis*, Lea, which I have recently found living within the city limits. All three are distinguished from *Nickliniana* by the character mentioned, although some come very near it, and, if united, *Californiensis* has priority.

San Francisco, Feb. 7, 1870.

San Juan in Central America, near Lake Nicaragua. Many other localities given by Kellett and Wood were confused, as "*H. Pandore* and *aspersa*, Sta Barbara." The latter, I am told by Dr. Newcomb, was obtained at the Sandwich Is., where it is naturalized. *H. Pandore* is also credited to "San Juan del Fuaco," which makes it probable that the place of that name near Cape St. Lucas, lat.  $26^{\circ} 5'$ , was the locality, as the latter species is confined to the peninsula. Forbes' figure also represents a small, highly colored form, quite different from that of the northern shell, and indicating a southern habitat. A considerable range of variation is seen in those from the various localities it is *known* to inhabit.

*A. intercisa*, W. G. Binn. As this species probably came from San Miguel Island, it is very possible that *crebristriata*, Newc., from Clemente I., is but a variety of it, both being scarcely more than extreme local varieties of *Kellettii*, growing abnormal toward the north. This is shown by many specimens of *crebristriata* being thin and faintly sculptured, when they show a mottled coloring like the latter. Small ones have been called *redimita* by W. G. Binney, but differ in this coloring and in having but  $5\frac{1}{2}$  instead of 6 whorls. It is much more likely that the latter was from the more often visited region of *Nickliniana*, near S. F. Bay.

*A. Tryoni*, Newc. This, although put by some in another genus, is too near *Kellettii* to be properly separated.

In my Synopsis, the phrase " $\ddagger$ . Colors light, often palest below. Inhabit dry or treeless regions, lat.  $32^{\circ}$  to  $36^{\circ}$ ," should have included Group XII, just mentioned, as well as the first part of Group XIII, (here made § A, *b*.) They resemble that section also in sculpture, but their affinity is plainly with *Arionta*, as indicated by form and band, though approaching the sub-tropical group of the peninsula referred by various authors to *Euparypha* and *Polymita*. I have retained *Carpenteri*, Newc., in this section with doubt, on account of the loss of the type and the imperfection or disagreement of specimens identified with it by Dr. Newcomb.

It appears that Ferussac and Deshayes (Hist. des Moll., I, p. 216,) considered one or more of the Californian species a mere variety of *A. arbustorum*! (Binney, Bibliog. part II, p. 143.) Other Europeans have done the same.

#### MESODON, Raf.

Although so generally adopted, the diagnosis of this genus by the author in 1831—"differs from *Helix* by lower lip with a



tooth"—if applied to any North American species, would not apply to *M. ? profunda*, Say, which has such a tooth or tubercle, because, as Mr. Tryon points out in this Journ. IV, p. 175, *Mesodon* could not have an umbilicus, for "*Odomphium* differs in having an ombilic." His type, *M. maculatum*, judging from the name, was spotted, variegated, or by a stretch of the term, striped, and the only species having stripes and no umbilicus found "in Kentucky" is *multilineata*, Say, which may then be adopted as the type of the genus.

But he had previously made a genus *Odotropis* (toothed whorl) which had "lip reflected, umbilicus covered, tooth upon columella," (meaning paries, as is evident from his description of *Triodopsis*). Although without a type mentioned, it is plain that this could apply only to the *exoleta* group among Kentucky species.

I adopted the name as including *H. ? devia*, at first as a section of *Mesodon*, Auct., to include those with a parietal tooth and a tooth or tubercle on the lower lip also, near the true columella, being satisfied, like Mörch, that these teeth were chiefly specific or subgeneric characters only. I am now pretty well satisfied that it ought to take precedence of *Mesodon* as a generic name, having twelve years priority; and should of course include many toothless or umbilicate Eastern species, for which, however, *Mesodon*, *Odomphium*, and perhaps *Trophodon*, of same date, may become subgenera.

I was wrong, however, in adopting "umbilicus covered" as a character of *devia*, though my specimen had it so; for the species is usually umbilicate, showing the uncertainty of this character even as a specific mark.

I did not include *Townsendiana* in the same genus in the Geog. Catalogue, because it shows in the shell much affinity to *Arionta*, through *arrosa*, *anachoreta*, etc., and has even been put unhesitatingly in that genus by Europeans, though differing so much from *A. arbustorum*. I now incline to think that it should be put in *Odotropis*, and that the surface characters linking it with the more southern *Ariontas* are merely similitive, just as we find the latter simulating or approaching *Polymita* as they come from nearer its region of habitat.

*O. ? anachoreta*, W. G. Binn. This can scarcely be the bandless variety of *arrosa*, as suspected by Tryon, for it has one whorl less (6), and specimens of *arrosa* quite as small have 7; the lip also seems broader in proportion, like that of Dr. Newcomb's var. *c* of *Nickliniana* from Klamath Co., "without band, umbilicus closed, not malleated; lip broadly expanded." This



cannot be the same, but Mr. Rowell's specimens from "Oregon" agree very well with *anachoreta*, and Dr. Newcomb's is either an extreme variety or a new species, I cannot say which, having none of either form to compare.

"*H. pedestris*," Gould, 1846 (animal excl.), wrongly credited to New South Wales, but in "Otia," p. 243, made a synonym of *Townsendiana*, describes a small variety almost of the size and proportions of *anachoreta*. It may do for the var. of the former without wrinkles.

#### APLONDON, Raf.

In my "West Coast Helicoid Land Shells" I considered this also a subgenus of *Odotropis*, as it was formed in the same year, having supposed that the type *A. nodosum* was *H. ? monodon*, var. *Leaii*, which appears to answer the description of both genus and species. The genus, "aperture rounded, columella with a single tooth, umbilicated," was thus contrasted with *Stenotrema*, which had been just described, and of which the type *S. convexum* (= *H. stenotrema*, Fer., two years later) nearly resembles *monodon* externally. *A. nodosum* has "3 [upper] whorls embossed, lightly wrinkled concentrically beneath," the "embossing" referring to the tubercles left by the bristles in worn specimens, and the "concentric" wrinkles probably meaning radiating growth lines.

*H. monodon* has been until lately considered a close ally of *Columbiana*, but the discovery of an internal "fulcrum" in *Stenotrema*,\* also found in *monodon*, has induced many to put it in that genus in spite of its wider mouth. If this character is to be the essential one of the genus (which is very improbable), *Columbiana* cannot be congeneric with *monodon*, nor *germana* either, according to Bland's testimony. The two forms so named by me as inhabiting this State both seem to want the fulcrum, but otherwise appear distinct, a few only being found intermediate as in other groups.

If the name *Aplodon* is not wanted for the *monodon* group, it may do for the bristly section of *Odotropis* to which *Columbiana* seems to belong.

*A. Columbianus*, Lea (Cp.) Many large typical specimens brought from Sitka by Mr. Harford have the animal uniform

\* Raf. altered this to *Stenostoma* in 1819 and 1831, having used the former name in 1815 differently.—Binney's Bibliography, ii, 283.

smoky-black like ours. The jaw is strongly arched, with eight broad ribs.†

Very thin and nearly smooth ones have been found near Antioch, at the junction of the San Joaquin and Sacramento rivers, with *Arionta ramentosa*, the most eastern point for both.

Some found near San Francisco have a parietal tooth, but the lip and umbilicus are so unlike the next that they are easily distinguished.

*A. ? germanus*, Gld. (Cp.) A few typical specimens have been found lately by Harford and Dunn, near the Columbia river.

*Triodopsis loricata*, Gld. Harford and Dunn found large ones at Clark's Ranch, Mariposa Co., 4000 feet alt., thus extending its southern range in the Sierra Nevada to lat.  $38^{\circ} 30'$ , the same as on the coast.

Mr. C. D. Voy has connected its range in the two mountain chains by discovering it at Shasta City, lat.  $40^{\circ} 37'$ , on the Sacramento river, which may be one locality of its discovery by the U. S. Expl. Exped. as given by Gould. The northern and eastern form is, however, much larger than the type, and this probably came from S. F. Bay, the same place as *Lecontii* of Lea, so that it is scarcely allowable to use this for the small form only.

#### DÆDALOCHEILA.

One perfect dead specimen, and one immature, but living, found by Harford and Dunn "at the Big Trees of Fresno Co.," 5000 to 6000 feet above the sea, are the foundation for adding another genus to our fauna, as well as a new species. It is nearest allied to *D. Behrii*, Gabb, of Guaymas, but differs from that and most others in its perspective umbilicus, and in the want of pits over the labial teeth. In form, size and umbilicus it closely resembles the *polygyrella* of Montana, thus curiously connecting that anomalous species with *Dædalocheila*. (See description of *D. Harfordiana*, this Journal, p. 196.

*D. ? polygyrella*, Bld. (Cp.) In the Synopsis I placed this in "*Helicodiscus* ?" on account of its internal teeth, but the preceding species suggests an idea that it is really a northern type of the same genus, in which the labial teeth have been "swallowed." Mr. Bland mentions one specimen in which the first

† Among those figured in Binney and Bland's "Geophila," it is between that of "*H. (Polygyra) ventrosula*" and "*H. (Stenotrema) monodon*," those of *Mesodon* all having 10 to 16 ribs.

row is "immediately behind the parietal tooth, and visible through the shell just within the aperture." Others may be found unfinished, showing whether the internal teeth are labial at any stage of growth, and if they ever come opposite the parietals.

Its far northern habitat, and station in damp moss under forests, indicate that the animal will be found to differ enough, at least, to put it in a peculiar subgenus.

ZUA SUBCYLINDRACEA, Chem. (*lubrica*, Müll.)

Was found by Harford in Alaska. Found in Ohio, etc.

LEUCOCHEILA ——— ?

Mr. Voy informs me that on the summit of the coast range, near lat. 41°, where he discovered *Mac. Voyana*, he obtained a number of specimens of Pupa-like shells which resembled the eastern *L. fallax*, but unfortunately lost them all while traveling. This year, Mr. Samuel Beannan, Jr., has found a single bleached subfossil specimen very near San Francisco, more like *L. fallax* than *L. Arizonensis* or *hordacea* (the only species yet found west of the Rocky Mountains), but probably distinct.

A "*Pupa*, sp. indet. jun.," was found at Lake Osoyoos, lat. 49°, Wash. Terr., by J. K. Lord, of the Brit. N. W. Boundary Survey (see Carpenter, Brit. Assoc. Rep. 1863, p. 606). This far northern shell may possibly prove the same with Voy's sub-alpine specimens, if not with the fossil from this vicinity.

*Vertigo corpulentus*, Morse, was also found common at Clark's Ranch by Harford and Dunn.

As mentioned by me in vol. iv, p. 223, no locality along this coast has furnished as many species as the neighborhood of S. F. Bay. Northern and southern forms here meet also in larger numbers than elsewhere, though it does not form the limit in either direction for many of them.

Two species of *Limacidae* still undetermined are also common, one resembling *L. campestris*, Binn., and found in nearly all parts of the State, the other like *L. flavus*, Linn., but distinct, its shell one-fourth of an inch long.

The following table shows the species occurring here, as well as their marked varieties, with the sides of the Bay on which they occur.

It will be noticed that all of the § C except one are found here, making it the metropolis of *Arionta* on this coast. That hybrids and varieties should be met with is therefore not astonishing.

Name of species or variety.				Side of S. F. Bay.			
				N	E	S	W
1.	<i>Succinea Oregonensis</i> , Lea,	.	.	N	E	S	W
2.	" <i>rusticana</i> , Bld.,	.	.	"	?	"	"
3.	" <i>Sillimani</i> , Bland,	.	.	"	"	"	"
4.	<i>Hyalina Breweri</i> , Newc.,	.	.	"	"	"	"
5.	<i>Pseudohyalina milium</i> , Morse,	.	.	"	"	"	"
6.	" <i>conspecta</i> , Bld.,	.	.	"	"	"	"
7.	" <i>Mazatlanica</i> , Pf.,	.	.	"	"	"	"
8.	<i>Patula Durantii</i> , Newc.,	.	.	"	"	"	"
9.	<i>Lysinoe infumata</i> , Gld.,	.	.	"	"	"	"
10.	<i>Arionta arrosa</i> , Gld.,	.	.	"	"	"	"
11.	" var. <i>arborescens</i> , Val.,	.	.	"	"	"	"
12.	" <i>exarata</i> , Pf.,	.	.	?	"	"	"
13.	" <i>Diabloensis</i> , Cp.,	.	.	"	?	?	"
14.	" <i>Nickliniana</i> , Lea,	.	.	"	"	"	"
15.	" var. <i>Bridgesii</i> , Newc.,	.	.	"	"	"	"
16.	" <i>nemorivaga</i> , Val.,	.	.	"	"	"	"
17.	" <i>ramentosa</i> , Gld.,	.	.	"	"	"	"
18.	" var. <i>reticulata</i> , Pf.,	.	.	?	"	?	"
19.	" <i>tudiculata</i> , Binn.,	.	.	"	"	"	"
20.	" <i>Californiensis</i> , Lea,	.	.	"	"	"	"
21.	" var. <i>redimita</i> ?, W. G. Binney,	.	.	"	?	"	"
22.	<i>Aplodon Columbianus</i> , Lea,	.	.	"	"	"	"
23.	" <i>germanus</i> ?, Gld.,	.	.	"	"	"	"
24.	<i>Triodopsis loricata</i> , Gld.,	.	.	"	"	?	"
25.	<i>Leucochila</i> ——— (extinct?),	.	.	?	"	"	"
26.	<i>Pupilla Californica</i> , Rowell,	.	.	"	"	"	"
27.	" <i>Rowelli</i> , Newc.,	.	.	"	"	"	"

*Notes on Binney and Bland's PULMONATA GEOPHILA.—Smiths. Inst., Feb., 1867.*

Having just received the above work, I can only make a few of the most important corrections as to West Coast species in addition to what is stated in the preceding paper, differing from the work in some particulars.

The extreme conservatism observable throughout is disappointing to those who looked for a new and thorough re-arrangement of the land shells, as the result of several years' study of the animals of nearly all the species. It seems as if consistency was sometimes sacrificed to the fear of innovation, as, for instance, on p. 69, where the jaw of "Genus *Helix*" is described, while that of the "Subgenus *Patula*," as given on pp. 75 and 86, is shown to differ very essentially. Also on pp. 83, 85, 157, 159, 184.

Many shells are grouped most arbitrarily, without any reference to the animals and without any regard to their form.

Thus, on p. 72, "*H. Ayersiana*" (misspelt) is put between *solitaria* and *strigosa*, for what possible reason is a mystery! Compare it with fig. 301 and *Dupetithouarsi* (not with the copy of Deshayes' fig.)

Why "*Hyalina conspecta*," p. 41, and "*Helix (Patula) Mazatlanica*," p. 82, while the animals are undescribed? The jaw of "*Binneia*" (misspelt), p. 68, and teeth also, are more like those of *Arion*, p. 276, than of *Limax*, p. 59, but because *Arion* has an additional mucous gland these closely related slugs are put far apart, and the *Binneya* connecting them with *Helicidae* is misplaced because no record was made of its having such a mucous gland! Why is *Townsendiana*, p. 164, in *Arionta*? *Columbiana* and *devia*, pp. 150 and 152, in *Mesodon*? No mention made of jaws or teeth.

Compare fig. 285 with 251, p. 147, or 260, p. 152. "Columbia R." for "*H. arrosa*" is one of the many errors of locality which the authors have not seen fit to correct by the latest and best authorities.

"*Helix cypreophila*, Newc." (MS.), p. 166, the umbilicate variety, need not have been mentioned, as Dr. N. admitted its identity with *tudiculata*, and never published a description. The specimens are mentioned by me in vol. iv, pp. 215 and 227, as a variety.

The "*H. Nickliniana*" figured on p. 166, and by Dr. Binney, is not the typical form, and is considerably narrower than the size given in text, or Lea's shell, but higher, measuring 1.00, 0.55, 0.80 inch. It appears, however, to be a link between this type and the small var. called *nemorivaga*, and is found near San Francisco.

"*H. redimita*," p. 167. The description and figure represent the northern form like *Californiensis*, but Mr. Binney adheres to the habitat as "San Clement I.," against which opinion I have already given reasons. Greater diam. is .21, not .31 millim.

I have nothing to add to the notes on *intercisa*, *crebristriata*, *exarata*, *reticulata*, *Bridgesii*, *ramentosa* or *Californiensis* already given, except that the locality, "interior of California, Com. Wilkes," given with the last, is certainly wrong, the var. *vineta* which is figured being confined to Monterey, and the type to the coast northward. Jaw figured with 5 ribs; "only 4" in text.

"*H. Carpenteri*, Newc., including *Remondii*, Tryon," p. 171. The shell figured appears like a var. of *rufocincta*, and does not agree with the dimensions given, which would form a much more elevated shell, like the *Remondii* of Guaymas. Dr. Newcomb



did not recognize the large San Diego variety as *Carpenteri*, though much like the shell figured, but referred it to *rufocincta*, some of which are as large as the figure.

It would please collectors here to find "*H. Dupetithouarsi*" at all the localities given on p. 174, but we find it only at Monterey. The authors seem to have confounded with it varieties of *fidelis* and *mormonum* elsewhere, while Benicia and San Diego must be mistakes in labeling by collectors.

"*H. tenuistriata*," MS. name, p. 175, was unnecessarily published, but the figure is useful as showing one of the fossil links between *Gabbi* and *rufocincta*, mentioned by me in vol. iv, pp. 218 and 235.

"*H. facta*," Newc. The fossil form only is figured, twice as large as the living.

"*H. (Euparypha) Tryoni*, Newc.," p. 178. This, of § D, as shown by jaws and teeth, is not very distantly connected with *arrosa*, of § C, while the type of *Euparypha (pisana)* has only 2—3 ribs (Albers)! It otherwise resembles *Arionta* much more nearly. The variations in the jaws of this species (ribs normally 6), as figured, are evidently imperfections, and cannot be taken as invalidating their specific value. As far as I have examined, the jaws furnish excellent specific differences even in species as nearly allied as those of *Arionta*, § C. In *Lysinoe*, § A and B, I find the jaw of *mormonum* closely resembling that of *facta* in form and number of ribs (8).

"*H. (Ampelita) Rowelli*, Newc.," p. 185, including *Lohrii*, Gabb. I cannot believe that the resemblance of this to *sepulcralis* of Madagascar is more than analogical. Its true affinity is as stated in vol. iv, p. 235, and in the preceding article. (*Sepulcralis* is 3-banded.)

"*Succinea Oregonensis*, Lea," p. 270, including "*S. Gabbii*, Tryon." The figure looks too much like *Nuttalliana* on the preceding page, while it differs entirely from Tryon's figure both of this and of *Gabbii*. Tryon's figure agrees best with *Oregonensis* of Lea, but on the other hand he gives a poor one of *rusticana*, Gld., of which Binney and Bland copy the original. Unfortunately Lea's types do not seem to have been figured, unless Tryon used them in preparing his work.

"*Zonites Newberryana*, W. G. Binn.," p. 282. The reference to this genus seems premature, the animal being unknown. Comparison with "*Z. cultellata*" opposite shows enough difference in the shell to separate it, though probably it is not a *Macrocyclus* either.

*Z. cultellata*, Thoms., if really found in California, must have



been an accidentally introduced colony, as the locality has since been carefully searched in vain.

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NOTE.—The following corrections are required in my article printed in vol. iv, 4, p. 209, &c.:

P. 209, line 16. For *callosi tateni*; *tenui*; read *callositata tenui*.

P. 215, line 15 from bottom, at end. Add *form as in*.

P. 226, line 20. For *cross* read *crop*.

P. 232, line 17 from bottom. After *mountains* add *southward*.

P. 233, line 5. For *distinction* read *distribution*.

P. 235, line 5. For *the* read *that*.

P. 236, at bottom. Add 216.

P. 240, line 11. For the sign || read =.

In some, if not all copies of the map, most of the signs used are very faintly printed, if not omitted entirely. The localities may usually be determined by the context.

# NOTICES AND REVIEWS

## OF

### NEW CONCHOLOGICAL WORKS.

BY GEO. W. TRYON, JR.

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#### I.—AMERICAN.

**Annals of the New York Lyceum of Natural History.** Vol. ix, No. 5.  
1869.

*Note on Bulimus ciliatus, Gould.* By A. D. BROWN.

Mr. Brown states that this Brazilian species has a reflected lip when mature, and as Gould's description contains the words "*labrum simplex*," he evidently described from an immature shell.

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**Proceedings of the Boston Society of Natural History.** October, 1869.

*On a new species of Pedipes, from Tampa Bay, Florida.*

By ROBERT E. C. STEARNS.

*P. naticoides*, Stearns.

*Molluscan Fauna of New Haven. A critical review of all the Marine, Fresh-water and Land Mollusca of the region, with descriptions of many of the living animals and of two new species.* By GEORGE H. PERKINS.

Part 1. *Cephalopoda* and *Gasteropoda*.

*Nassa Fretensis*, Perkins, n. sp.

The author says of the ova-capsules of *Crepidula unguiformis*, Lam., (*C. plana*, Say,) that they "are similar to those of *C. fornicata*, but are broader, shorter and thinner, and the ova are

differently situated." This is important, in view of the fact that Dr. J. E. Gray (Zool. Proc., 1869), has recently considered the two species identical. The ova-cases of *Fulgur carica* and *Sycotypus canaliculatus* are described at length.

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**Canadian Naturalist.** New Series. III, No. 1, Montreal, Mar., 1869.

*On the Marine Mollusca of Eastern Canada.* By J. F. WHITEAVES.

Contains, besides the list of species, frequent remarks on synonymy, etc.

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**Index to Vol XII, and Supplementary Index to Vols. I to XI of Observations on the Genus Unio, &c.** By ISAAC LEA. 4to. pp. 23. Philadelphia, 1869.

A continuation of Dr. Lea's very useful index, and including an index of subject matter contained in the twelve volumes other than names of genera and species.

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## II.—FOREIGN.

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### ENGLISH.

**Proceedings of the Zoological Society of London.** Part 1, 1869.

*Descriptions of twelve new species of Land and Marine shells from Australia and the Solomon Islands.* By GEORGE FRENCH ANGAS.

<i>Haliotis Brazieri,</i>	<i>Helix Donna Isabellæ,</i>
<i>Triton Bassi,</i>	" <i>eudora,</i>
" <i>Brazieri,</i>	" <i>Howardi,</i>
<i>Helix deiopeia,</i>	<i>Minolia pulcherrima,</i>
" <i>Rossiteri,</i>	" <i>bellula,</i>
" <i>Dampieri,</i>	<i>Thracia speciosa.</i>

*On a new species of Haliotis, from New South Wales.*  
By J. C. COX, M. D.

*Haliotis Hargravesi,* Cox.

*Descriptions of the Animals of certain genera of Auriculidæ.* By WM. HARPER PEASE.

*Additional Notes on the Land Shells of the Seychelles Islands.* By GEOFFREY NEVILL.

Several new species are named, but none described in this paper.

*On a new British Nudibranch.* By W. S. KENT.

*Embletonia grayi*, Kent.

*Observations on the Distribution of Bulimus miltocheilus in the Solomon's Archipelago.* By JOHN BRAZIER.

**Conchologia Iconica.** Parts 280, 281. By G. B. SOWERBY.

*Anodon.* Plates 21 to 24. Aug., 1869.

Sp. 83. "*A. decora*, Lea" is *A. grandis*, Say.

*A. fluviatilis* is drawn and colored from a specimen that is not at all characteristic either in form or color. The species should be credited to Dillwyn, not Lea.

Sp. 88. *A. biangulata*, Sowerby, nov. sp. Hab.—?

Sp. 95. *A. Amethystus*, Sowerby, nov. sp. Hab.—?

*Aplysia.* 10 plates. Aug., 1869. Complete.

*A. gigantea*, Sowb. Australia. *A. fimbriata*, Adams and Reeve.

"*trigona*," " Hab.—? Siberia.

"*hyalina*," " Australia. "*Sandwichensis*, Sowb. Sand-

"*Japonica*," " Japan. wick Isles.

"*Guadaloupensis*, Sowb. Gua- "*orientalis*, Sowb. Chinese S.

daloupe. "*anguilla*, Cuming Mss. Hab.—?

"*bipes*, Pease. Pacific O. "*Sinensis*, Sowb. China.

"*Sydneyensis*, Sowb. Aust'lia. "*grandis*, Pease. Pacific O.

"*Angasi*, Sowb. Australia. "*similis*, Sowb. Hab.—?

"*cornicera*," " Philippines. "*Norfolkensis*, Sowb. Nor-

"*excavata*, Sowb. Australia. folk Island.

*A. subquadrata*, Gould. United States.

Dr. Gould never published this species; it is not distinct from *A. punctata*, Cuv.

*Pleurobranchus.* 1 plate, complete. Aug., 1869.

*Cucullara.* 1 plate. Aug., 1869. Complete.

**Memoirs of the Literary and Philosophical Society of Manchester (England).** Vol. 3, (third series) 1868.

*Notes on Marine Shells found in Stratified Drift near Macclesfield.* By R. D. DARBISHIRE.

#### FRENCH.

**Journal de Conchyliologie.** 3d Ser. IX, No. 4. Paris, Oct., 1869. 132 pp. and 4 plates.

*Sur la mâchoire et l'armature linguale des Cyliindrelles.*

By H. CROSSE and P. FISCHER.

*Faune Malacologique terrestre et fluviatile des Iles Samoa, publiée d'après les envois de M. le Dr. E. Græffe.*  
By ALBERT MOUSSON. (3d Article.)

<i>Nanina perpolita,</i>	<i>Melampus semisulcatus,</i>
<i>Gastrodonta ensifera,</i>	<i>Ostodes adjunctus,</i>
<i>Endodonta Græffei,</i>	<i>Melania bifasciata,</i>
<i>Trochomorpha tuber,</i>	“ <i>laxa,</i>
<i>Partula abbreviata,</i>	“ <i>peregrina,</i>
<i>Tornatellina conica,</i>	“ <i>acute-spira,</i>
<i>Cassidula crassiuscula,</i>	<i>Theodoxus Godeffroyanus,</i>
<i>Pythia Savaensis,</i>	<i>Clithon propinquus,</i>
	<i>Clypeolum planissimum.</i>

*Trochomorpha subtrochiformis*, Mousson, is proposed for the *Helix trochiformis*, Gould, (non Fer.) = *H. Eurydice*, Mousson, (non Gould.)

*Description d'espèces nouvelles.* By H. CROSSE.

The species, all previously described, are now remarked upon and figured.

*Description de trois Fusus nouveaux du Groënland.* By O. A. L. MÖRCH.

*Fusus Lachesis,*      *Fusus Ebur,*      *Fusus togatus.*

*Liste des espèces de Coquilles terrestres et fluviatiles recueillies dans la vallée de Baréges en 1868, et n'ayant pas encore été signalées dans cette localité.* By CAPT. L. MORELET.

*Observations critiques sur quelques Paludines de l'Indochine.* By ARTHUR MORELET.

*Diagnoses Molluscorum novorum.* By H. CROSSE.

*Murex Hidalgoi.*      *Nassa Tryoni.*

*Description d'espèces nouvelles.* By DR. J. G. HIDALGO.

*Helix quadrivittata*, Rep. Equador.      *Orthalicus Pfeifferi*, Rep. Equador.

“ *Martinezi*. Brazil.      *Pupa Pazi*. Peru to Panama.

“ *Amancezensis*. Peru.      *Clausilia Crosseii*. Equador.

“ *Baezensis*. Equador.

*Diagnoses Molluscorum Novæ Caledoniæ incolarum.* By H. CROSSE.

*Helix calliope,*      *Helix Perroquiniana,*  
“ *Alleryana,*      *Melania Lamberti.*

*Diagnoses de Mollusques inédites provenant de la Nouvelle Calédonie.* By DR. SOUVERBIE.

<i>Helix Ouveana,</i>	<i>Adeorbis striatella.</i> Montrouzier.
<i>Bulimus Annibal,</i>	<i>Lambettia.</i> N. Genus.
" <i>Boulariensis,</i>	<i>L. Montrouzieri,</i> Souverbie.
<i>Pleurotoma dentatum,</i>	<i>Caledoniella.</i> N. Genus.
<i>Turbinella scabra,</i>	<i>C. Montrouzieri,</i> Souverbie.

*Diagnoses Molluscorum novorum.* By H. CROSSE.

<i>Helix votiva.</i> Madagascar.	<i>Bulimus Pluto.</i> Peru.
	<i>Bulimus Prometheus.</i> Peru.

*Diagnoses Molluscorum novorum Guatemale et Republice Mexicane.* By H. CROSSE and P. FISCHER.

<i>Orthalicus leucochilus,</i>	<i>Glandina Nympha,</i>
<i>Stenogyra Colimensis,</i>	" <i>bellula,</i>
" <i>Bocourtiana,</i>	" <i>difficilis.</i>

*Description d'une nouvelle espèce de Volute du terrain oligocène.* By O. A. L. MÖRCH.

*Description d'une espèce nouvelle de Rotella fossile du S. E. de la France.* By P. FISCHER.

*Bibliographie.*

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**Bulletin de l'Academie Imperiale des Sciences de St. Petersburg.**  
XIII, No. 4.

*Le Système nerveux de la Patella vulgaris.* By DR. EDW. BRANDT (with a plate.)

*Le Système nerveux du Chiton (Acanthochites) fascicularis.*  
By the same (with a plate.)

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**Revue et Magasin de Zoologie.** Conducted by GUERIN-MENEVILLE. Nos. 6, and 7, 1869.

*Descriptions de quelques Paludiniidées, Assiminiidées et Mélanidées nouvelles.* By DR. PALADILHE.

<i>Bythinia Bourguignati.</i> Per-	<i>Amnicola Sarahæ.</i> Nantes.
pignan.	" <i>Melitensis.</i> Malta.
<i>Amnicola Maceana.</i> Barcelona.	" <i>Balearica.</i> Balearic I.
" <i>lanceolata.</i> Pyrenees.	" <i>mamillata.</i> Italy.
" <i>Emiliana</i> " "	<i>Paludinella Armorica.</i> France.
Italy, &c.	" <i>turgidula.</i> France.
" <i>spirata.</i> Pyrenees, &c.	" <i>pupoides.</i> France.
" <i>canaliculata,</i> " "	" <i>turriculata.</i> " "
" <i>compacta.</i> Spain.	<i>Belgrandia cylindrica,</i> " "



To the genus *Belgrandia*, founded by Bourguignat in 1868, upon fossil species from the inferior diluvium of the vicinity of Paris, are assigned the following living species: *Hydrobia gibba*, Dupuy, *H. Moitessieri*, Bourg., *H. Lusitanica*, Paladilhe, *Paludina varica*, Paget.

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ITALIAN.

**Bulletino Malacologico Italiano (Terrestrial and fluviatile Mollusca.)** Vol. I, 8 vo. Pisa, 1868.

This new conchological publication consists of 16 pages, issued bi-monthly, making six numbers per annum, with a lithographic plate for each number.

*Dei Molluschi terrestri e d'acqua dolce raccolti nello Archipelago di Malta.* By A. ISSEL.

*Clausilia Lucensis*, n. sp.      *Physa Pisana*, n. sp.  
*Zonites Mortilleti*, n. sp.

*Pupa Mortilleti*, Martens; *Synonymical study.* By J. STABILE.

*Esistenza dello Zonites Leopoldianus nell'Italia Settentrionale.* By STROBEL.

*Clausilia Lucensis*, Mihi, e *Claus. Comensis*, Shuttle. By C. GENTILUOMO.

*Specie Nuove.* By VILLA.

*Clausilia Isseli*, Villa.

*Osservazioni sulla Clausilia Mofellana*, Parreyss. By C. GENTILUOMO.

*Intorno ad alcune Conchiglie degli Abruzzi Zonites Gerafalechensis, olim Mortilleti.* By V. PECCHIOLO.

*Intorno ad una forma speciale dell' Helix Gobanzi, Frauenfeld.* By C. GENTILUOMO.

*Unio Lavvleyianus*, *Specie Nuove.* By C. GENTILUOMO.

*Catalogo dei Molluschi terrestri e fluviatili della Toscana.* By C. GENTILUOMO.

*Limax Etruscus*, Issel, n. sp.      *Testacella Becarii*, Issel, n. sp.  
*Clausilia Apennina*, "      *Bythinia Isselii*, Gentil.

Besides the above, the volume contains extracts from contemporary conchological publications, and bibliographical notices.

**Bulletino Malacologico Italiano.** Vol. 2, 1869. Nos. 1, 2, 3. (Including Marine Mollusca. The Numbers enlarged to 32 and 48 pp.)

*Nota dei Molluschi terrestri.* By A. VILLA.

*Le Conchiglie del Mar Tirreno.* By F. S. APPELIUS.

*Aturia Spinellii, specie nuove.* MENEGHANI.

*Mactra Pecchiolii, specie nuove.* By R. LAWLEY.

*Note addizionali all' Articolo del Signor Ed. V. Martens "Intorno ad Alcune Conchiglie degli Abruzzi."* By D. N. TIBERI.

*Helix Orsinii, Porro.* *Helix Martensiana, Tiberi.*

*Sulle Neretine fossili dei terreni terziari superiori dell'Italia centrale—Nota palaeontologica.* By C. D. ANCONA.

*Nassa Italica, specie nuove.* By ISSEL.

*L'Habitat dei Molluschi Marini, Saggio critico.* By DR. A. MANZONI.

*Sul modo di conservare vive le Elici.* By PROF. AB. G. STABILE.

*Mutamente nella condizioni esterne della dimora dei Molluschi, qual causa di modificazioni nella conchiglia di una stessa specie.* By C. GENTILUOMO.

*Fauna Malacologica Marina dell' Isola d'Elba.* By C. GENTILUOMO.

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GERMAN.

**Fauna der Land und Susswasser Mollusken Seibenburgens.** By E. A. BIELZ. 2d Edition, 216 pp., 8 vo. Hermannstadt, 1867.

The first edition of this very complete local catalogue was published, I think, in 1863, and the present issue adds descriptions of the soft parts of most of the species, together with many critical remarks, details of habitat, &c. There are a few new species described, as follows:

*Vitrina plicosa*, Bielz. *Bythinia Troscheli*, Paasch.

*Pisidium cuneatum*, Bielz.

*Hyalina vitrea*, Bielz, is substituted for *Helix hyalina*, Fer., because the word *Hyalina* has become generic.

I cannot recommend the adoption of this changed name, as I believe that the best interests of Natural Science are concerned in preserving inviolate specific names, with the addition of the name of the describer of the species. If *Hyalina hyalina* be

entirely objectionable to Mr. Bielz he had better alter the *generic* name.

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**Archiv fur Naturgeschichte.** 34th year, 5th part. Berlin, 1868.

*Bericht über die Leistungen in der Naturgeschichte der Mollusken während des Jahres, 1867.* By TROSCHEL.  
(Concluded.)

This review includes from the terrestrial species (partly) through the fluviatile genera and the marine bivalves to the end.

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**Novitates Conchologicae.** Supplement IV, Japanische Meeres Conchylien.  
A contribution to the knowledge of the Mollusks of Japan, with various observations upon their geographical distribution. By Dr. C. E. LISCHKE, 1—4th Parts, with 7 colored plates.

The preliminary pages are devoted to an exhaustive review of the geographical distribution of the species of mollusca occurring in the Japan Seas.

The following species are described as new :

*Drillia Japonica*,                      *Lampania multiformis*,  
*Vermetus nodoso-rugosus*.

The author has corrected a number of errors in the diagnoses and assigned habitats of previously described species. Quite a number of American West-Coast species extend from California northward across to the Asiatic side, and from Kamschatka southward to the Japanese Archipelago.

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#### ERRATA TO MR. CONRAD'S PAPERS PUBLISHED IN THIS VOLUME OF THE JOURNAL.

P. 101 Exclude *Carditamera macropleura*.

For *Gadus obnutus*, read *Gadus obrutus*.

*Donax Forbesii*, for fig. 27, read fig. 25.

P. 96. *P. Spillmani*. The second paragraph under this head refers to the genus *Protocardia*, not *Pachycardium*.

P. 105. *Capulus Shreevei* is a tooth of *Pholas costata*.

P. 107. *Cyrena protexta* is a synonym of *C. Floridana*.

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#### ERRATA TO VOL. IV.

P. 275. *Astarte veta*. The reference should be to figure 4, and that of *V. annosa* to fig. 5. •

## APPENDIX.

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### RECORDER'S REPORT FOR 1869.

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During the year ending Dec. 2d, 1869, there have been elected one member and three correspondents.

One member has resigned.

Papers have been accepted for publication in the Journal, by the following authors :

T. A. Conrad,	5	John H. Redfield,	1
G. W. Tryon, Jr.,	9	S. R. Roberts,	1
W. M. Gabb,	5	Theo. Gill, M.D.,	1
W. Harper Pease,	3	W. H. Dall,	1
Jas. Lewis, M.D.,	2	Ralph Tate,	1
Temple Prime,	1	Wesley Newcomb, M.D.,	2
Binney and Bland,	1	J. G. Cooper, M.D.,	2

Respectfully submitted,

S. R. ROBERTS,

*Recorder.*

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### CORRESPONDING SECRETARY'S REPORT.

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*To the Conchological Section of the Academy of Natural Sciences, Philadelphia :*

The Corresponding Secretary would respectfully report that letters have been forwarded and received as follows, viz. :

*Dec. 31st, 1868.*—To Dr. Leopold von Schrenck, St. Petersburg, with publications.

*Jan. 5th, 1869.*—To Hugh Nevill, F.R.A.S., Galle, Ceylon, accepting proposals for exchange.

*May 13th.*—To Luigi Benoit, Messina, letter of acknowledgment.

*May 21st.*—To Dr. H. E. v. Rijgersma, St. Martins, W. I., soliciting collections.

To W. B. Pryor, Esq., Shanghai, China, soliciting collections.

*June 11th.*—To Prof. Joseph Henry, Smithsonian Institution, soliciting publications.

*June 22d.*—To the Société Malacologique de Belgique, Bruxelles, exchange of publications.

To E. A. Bielz, Hermannstadt, Transylvania, exchanges.

To *Bulletino Malacologico Italiano*, Pisa, for exchange of publications.

*June 23d.*—To R. J. Lechmere Guppy, Trinidad, exchange of specimens.

*Nov. 5.*—To Sylvanus Hanley, Middlesex, England, letter of acknowledgment.

The following letters have been received ;

*Dec. 29th, 1868.*—M. de Malzine, Bruxelles, with publications.

Mons. Terver, Lyons, France, acknowledgment of election.

Dr. Leopold von Schrenck, St. Petersburg, with publications.

*Jan. 7th, 1869.*—D. F. Heynemann, Frankfort, with publications.

Arthur Morelet, Dijon, France, letter of acknowledgment.

Mons. H. Crosse, Paris, with publications.

Frederick Calliaud, Nantes, France.

*Feb. 4th.*—J. R. Bourguignat, acknowledgment.

*Feb. 16th.*—F. M. Souverbie, Bordeaux, acknowledgment of election.

Capt. J. Mitchell, Madras, with publications.

*March 4th.*—L. H. Abbott, Boston, letter of acknowledgment.

Philip Lutley Sclater, London, letter of acknowledgment.

Zoological Society, London, letter of acknowledgment.

*March 30th.*—F. de Malzine, Brussels, proposals for exchange.

*May 6th.*—B. Westermann & Co., New York, publications.

S. L. Abbott, Boston, with publications.

E. C. Bolles, Portland, Me., acknowledgment of publications.

Leon Vaillant, Paris, acknowledgment of election.

Philip Lutley Sclater, London, acknowledgment of publications.

L. Chenu, Paris, acknowledgment of election.

Prof. O. A. L. Mörch, Copenhagen, with paper for publication.

*May 12th.*—Luigi Benoit, Messina, acknowledgment of case of shells.

*August 5th.*—D. C. Gentiluomo, Pisa, exchange of publications.

*Oct. 16th.*—Sylvanus Hanley, Middlesex, Eng., with case of shells.

E. A. Bielz, Hermannstadt, with publications.

*Oct. 29th.* W. B. Pryor, Shanghai, China, information as to collecting shells.

All of which is respectively submitted,

E. R. BEADLE,

*Philad., Dec. 1st, 1869.*

*Corres. Sec.*

### CONSERVATOR'S REPORT

For 1869.

The Conservator of the Conchological Section respectfully reports that the donations to the Cabinet during the year have been as follows :

From ISAAC LEA. Nineteen species of *Unionidæ* from Ouachita, Arkansas, *Chamostrea albida*, Roissy, with oscicle, from New South Wales, and twelve species of shells from the island of Andaman, Bay of Bengal.

E. R. BEADLE. Three species of *Unio*, *Auricula aurismidæ*, Lin., and two unknown species from Asia ; also a *Trochus* from the West Indies, and *Trivia sulcata*, Dillw.

JOHN FORD. Seven specimens of *Busicon aruanum* from Atlantic City, fine specimens of *Natica heros* from Brigantine Beach, N. J., and types of *Astarte nubigena*, Ford.

F. V. HAYDEN, M.D., Numerous specimens of *Helix Cooperi*, Bland, and *H. Haydeni*, Gabb, from Weber Canon, near Salt Lake City.

GEO. W. TRYON, JR. Eleven species from O. A. L. Mörch, of Copenhagen.

J. L. LECONTE. Type specimens of five species of *Melania* described by Isaac Lea.



- WM. M. GABB. Eleven species of *Unio* from Central America and twenty-four species of land shells from San Domingo personally collected, including several undescribed species.
- RALPH TATE. Seventy-seven species, numerous specimens of land and fresh-water shells from Central America, Venezuela, Guayana and Nicaragua, including types of several new species described in our Journal; also nineteen species of land shells from Venezuela and the island of San Lucia, W. I., mostly undescribed.
- W. H. PEASE. Seventy-nine species of marine shells from the Polynesian Seas, including types of new species.
- R. E. C. STEARNS. Sixty-four species of marine, fresh-water and land shells, principally from California, Oregon, South Carolina and Florida, and seven species from Tampa Bay.
- F. A. HASSLER, M.D. Fine specimen of *Marginella carnea* Storer, fine series of *Linnaea columella*, and embryos of *Vivipara Nolani* and *Busycon carica*.
- W. H. DALL. Five species of *Lepitidae*, types of descriptions published in the Journal.
- W. S. W. RUSCHENBERGER. Two hundred and seventy-seven species, principally marine mollusca, personally collected by the donor.
- DR. J. C. COX. Two hundred and twenty-three species, land, fresh-water and marine shells of Australia, New Caledonia and adjacent islands, including types of many new species.
- W. H. PEASE. Sixty-three species of marine shells from the Polynesian seas including types of new species published in the Journal.
- CHICAGO ACADEMY OF NATURAL SCIENCES. Thirty-four species of Japanese mollusca, collected by F. Bischoff.
- REV. ALDEN GROUT. Eight species of land shells from Port Natal.
- SMITHSONIAN INSTITUTION. Five hundred land, fresh-water and marine shells, carefully named by Mr. P. P. Carpenter.
- LUIGI BENOIT. One hundred and eighty-six species of land shells from Sicily, including types of most of his descriptions.
- J. H. THOMSON. *Cyprea picta*, *C. zonata*, *C. annulus*, *C. obvelata* and *C. Beckii*; *Trivia candidula* and *T. pulex*.
- SYLVANUS HANLEY. Four hundred and four species of land, fresh-water and marine shells, principally European, but in-

cluding a number of rare East Indian shells, some of them undescribed.

PAUL TERVER. One hundred and seventy-six species of European land and fresh-water shells.

Smaller collections have been received from Gabriel Duqué, E. H. Jenks, Prof. J. Powell, Edw. D. Cope, G. A. Lathrop, Mrs. Lewis, Dr. Jos. Leidy, C. W. Peale, Dr. James Lewis, Dr. Samuel Lewis, A. H. Smith, John Wolf, J. R. Willis, Dr. Harrison Allen and W. L. Mactier.

The number of species presented during the year amounts to about 2150, many of them new to the collection, and a yet greater number from localities not heretofore represented.

The systematic arrangement of the collection has proceeded from the *Pholadidæ* to the end of the *Tellinidæ*. The thanks of the section are due to Messrs. Parker, Roberts and Hassler, who have devoted a considerable amount of time to this work, and have succeeded in perfecting an arrangement of the specimens which has been much admired for its neatness, as well as for the opportunity it gives the student of studying, without disturbing the shells.

During the year we have continued to receive collections from many of our foreign correspondents, as will be seen by reference to the list of donations given above. The following collections have been sent in exchange by the Section: One hundred species of American shells to Luigi Benoit, accompanied by a list of Sicilian species desired by us; eighty species to Aug. Brot, and types of Mr. Gabb's new species to H. Crosse. A collection of our duplicate *Veneridæ* has been forwarded to Dr. Edw. Römer, to assist him in preparing for the Section a catalogue and synonymy of the *Veneridæ*, which work he has kindly undertaken to perform.

All of which is respectfully submitted.

EDWARD J. NOLAN,  
*Conservator.*

## LIBRARIAN'S REPORT.

The Librarian respectfully reports that there have been presented during the past year to the library of the Conchological Section 10 volumes, 91 pamphlets and 1 map. Of these 34 were received from authors, 20 from editors, 30 from Societies, 5 from the Publication Committee, 1 from Wm. M. Gabb, 1 from Don Rafael Arango, 10 from Geo. W. Tryon, Jr., and 1 from the Smithsonian Institution.

In addition, thirty-two pamphlets, volumes and continuations of Conchological works have been received through the Academy.

During the year the Catalogue has been carefully revised, and the books numbered, with the effect of greatly lessening the labor of those referring to them.

EDW. J. NOLAN, *Librarian*.

## DONATIONS TO LIBRARY.

1869.

- Adams, A. On the Veneridæ, Cæcidæ, Corbulidæ, Volutidæ, Cancellaridæ, Patellidæ, Mitridæ, &c., found in the seas of Japan. 5 pamphlets. From the Author.
- Bielz, E. Albert. Fauna der Land und Süswasser Mollusken Siebenbürgens. Zweite Auflage. Hermannstadt. From the Author.
- Bland, Thomas. Additional notes on the Geographical Distribution of Land Shells in the West Indies. From the Author.
- Blanford, Wm F. On the Animal and Operculum of Georissa, W. Blanf., and on its relations to Hydrocena, Parreyss; with a note on Hydrocena tersa, Bens. and H. milium, Bens. From the Author.
- Contributions to Indian Malacology. No. ix. Descriptions of new Diplommatinæ from Darjinnag and the Khasi Hills. From the Editor.
- Boston. Proceedings of the Boston Society of Natural History. Vol. XII, pp. 112 et seq., and Vol. XIII, pp. 1—128. From the Society.

- Memoirs read before the Boston Society of Natural History. Vol. I, Part IV, 1869. From the Society.
- Bourguignat, M. J. R. Mollusques Nouveaux, litigieux ou peu connus. 9me and 10me Fasc. Paris, 1868. From Geo. W. Tryon, Jr.
- Brown, A. D. Supplement to A. D. Brown's Catalogue. Dec., 1868. From the Author.
- Cox, Dr. J. S. Exchange List of Land and Marine Shells from Australia and the adjacent islands. From the Author.
- Crosse, H. et P. Fischer. Diagnoses Molluscorum Novorum Guatemalæ et Republicæ Mexicanæ. From the Authors.
- Currier, A. O. Kent Scientific Institute, Miscellaneous Publications. List of the Shell-bearing Mollusca of Michigan, especially of Kent and the adjoining counties. Grand Rapids, 1868. From the Author.
- Frankfort A. M. Nachrichtenblatt der deutschen Malakozoologischen Gesellschaft. Nos. 1, 2 and 3. Dec., 1868. Frankfort A. M. From the Society.
- Frauenfeld, Geo.-Ritter von. Zoologische Miscellen. XIV. From the Author.
- Beiträge zur Fauna der Nicobaren. II. From the Author.
- Lea, Isaac, LL.D. Observations on the Genus Unio. Vol. XII. From the Author.
- Index to Vol. XII of Observations on the Genus Unio. Vol. II. From the Author.
- Descriptions of twelve new species of Unionidæ from South America, &c. Philadelphia, 1868. From the Author.
- London. Proceedings of the Scientific Meetings of the Zoological Society of London for the year 1868. Part II. Index, 1848—1860. From the Society.
- Malzine, F. de. Essai sur la Faune Malacologique de Belgique. Bruxelles, 1869. From the Author.
- Map of North America, to illustrate the geographical distribution of life. From the Boston Society of Natural History.
- Martens, E. v. Die Preussische Expedition nach Ost-Asien Zoologischer Theil. 2er Band. Die Landschnecken. Berlin, 1867. From the Author.
- Uebersicht der Land und Süßwasser Mollusken des Nil-Gebietes. From the Author.
- On Mexican Land Shells. From the Author.
- Mitchell, J. Catalogue of the Mollusca in the collection of the Government Central Museum, Madras. From the Author.

- Museum Arangianum Moluscos. Las especies de la isla de Cuba estan excluidas. From Don Rafael Arango.
- Museum Godeffroy. Catalog IV. Hamburg, 1869. From the Author.
- Nevill, G. and H. Descriptions of Marine Gasteropoda from Ceylon. From the Authors.  
 Descriptions of a new genus and five new species of marine Univalves from the Southern Province, Ceylon. From the Authors.
- New York. Annals of the Lyceum of Natural History of New York. Vol. IX, Nos. 1 to 7, 1869. From the Society.
- New Haven. The American Journal of Sciences and Arts. Second Series. Nos. 139—143. From the Editors.
- Palæontology of California. Vol. II, from p. 39 to end. From Wm. M. Gabb.
- Paris. Journal de Conchyliologie. Tome VIII and Tome IX, Nos. 1—4. From the Editor.
- Philadelphia. American Journal of Conchology. Vol. IV, Parts 4 and 5, and Vol. V, Parts 1 and 2. From the Publication Committee.  
 Catalogue and Synonymy of the Genera, Species and Varieties of recent Mollusca described prior to Jan. 1, 1867. Parts 2 and 3, 1869. From the Publication Committee.
- Proceedings of the Academy of Natural Sciences of Philadelphia. Nos. 4 and 5, 1868, and Nos. 1 and 2, 1869. From Geo. W. Tryon, Jr.
- Journal of the Academy of Natural Sciences. New Series. Vol. VI, Part 4, 1869. From Geo. W. Tryon, Jr.
- Pisa. Bullettino Malacologico Italiano. Anno I and Anno II, Nos. 1, 2 and 3. 1868—69. From the Editor.
- Poey, Felipe. Memorias sobre la historia Natural de la Isla de Cuba. 8vo. Habana, 1851. From the Author.
- Poulsen, C. M. Fortegnelse over de i Flensborgs naermeste Omegn forekommende skalbaerende Landog Ferskvande-bløddyr. From the Author.
- Roberts, S. R. Catalogue and Synonymy of Porcellanidæ and Amphiperasidæ. From the Author.  
 Descriptions of three new species of Cypræa. From the Author.
- Salem. The American Naturalist. Vol. II, Nos. 1—12, Vol. III, Nos. 2—9. From the Editor.
- Proceedings of the Essex Institute. Vol. V, No. 8. 1868. From the Society.

Bulletin of the Essex Institute. Vol. I, Nos. 1—4, 1869.  
From the Society.

First Annual Report of the Trustees of the Peabody  
Academy of Sciences. 1869. From the Academy.

Saussaye. Catalogue des Mollusques Testaces des Mers d'Europe,  
par M. Petit de la Saussaye. 1869. From the Author.

Schrenk, Dr. L. V. Reisen und Forschungen in Amur-Lande in  
der Jahren 1854—1856. 2er Band, 3e Lief. St. Pe-  
tersburg, 1867.

Stearns, R. E. C. Conchological Memoranda, No. 4. On a  
new species of Pedipes from Tampa Bay, Florida.  
From the Author.

Catalogue of California Shells offered for exchange. By  
R. E. C. Stearns. From the Author.

Vienna. Verhandlungen der K. K. Zoologisch-Botanischen  
Gesellschaft in Wien. XVIII Band. Wien, 1868.  
From the Society.

Washington. Annual Report of the Board of Regents of the  
Smithsonian Institution for 1868. From the Institu-  
tion.

The following have been received by the Academy :

Binkhorst, J. J. T. Monographie des Gasteropodes et des  
Cephalopodes de la Craie Superieure du Limbourg.  
Bruxelles, 1861.

Cassel. Malakozologische Blätter. 15er Band, 6—11 Bog.  
Pp. 177 to 226.

Novitates Conchologicæ. 1 Abth., 33—35 Lief. III.  
12—15. Venus, pp. 137—145. Lfg. 16—19. IV, 1  
—4 Lief.

Jeffreys, J. Gwynn. British Conchology. Vol. IV and V. Ma-  
rine Shells. London, 1867.

Lea, Isaac. Observations on the Genus Unio. Vol. XII.

Martini und Chemnitz. Systematisches Conchylien-Cabinet.  
10 Band, Heft IV. 11er Band, Heft V. Lief 188 to  
193.

Paladilhe, Mr. Nouvelles Miscellanées Malacologique. 2me  
and 3me Fasc.

Pfeiffer, Ludovico. Monographia Heliceorum viventium. Vol.  
5 and 6. Lipsiæ, 1868.

Reeve, L. Conchologia Iconica. Parts 274 to 281.

Schramm, M. A. Catalogue des Coquilles de la Gaudeloupe.  
2d Ed.

Woodward, Dr. S. P. A manual of the Mollusca. 2d Ed. Lon-  
don, 1868.



## REPORT OF PUBLICATION COMMITTEE.

HALL OF THE ACADEMY OF NATURAL SCIENCES, }  
*Philadelphia, Dec. 2d, 1869.*

The Publication Committee of the Conchological Section reports its operations for the current year as follows :

Parts 4 and 5, Vol. FOURTH, American Journal of Conchology, containing 227 pp. and ten plates, of which four are colored, were issued Feb. 4th and May 6th, respectively. Of the new (5th) volume, two Parts have been published, embracing 176 pp. and thirteen plates, of which four are colored. The third Part of the Volume is now in press, and will be issued about the close of the year ; it contains a number of valuable papers and four colored plates. Part 4, completing the Volume, will include the papers and reports presented this evening.

The Committee congratulate the Section upon the large number of valuable papers which have been published this year, and also, upon a further slight increase in our subscription list.

Besides the Journal, we have published the following numbers of the "Catalogue of Recent Mollusca :"

Part 2. Anatinidæ, by T. A. Conrad ; Saxicavidæ, Myidæ, Corbulidæ and Tellinidæ, by G. W. Tryon, Jr. ; Pandoridæ, by P. P. Carpenter. 76 pp. May, 1869.

Part 3. Corbiculadæ, by Temple Prime. 60 pp. Oct., 1869.

Part 4. Porcellanidæ and Amphiperasidæ, by S. R. Roberts. 25 pp. Nov., 1866.

In our last report we announced that a sufficient number of subscribers' names had been obtained to cover the expense of re-issuing Haldeman's Monograph of American Fresh Water Shells, and a continuation of that work embracing species described since its publication. We have been actively employed this year in preparing these books, and have had twelve or fifteen plates drawn and colored for them. They will be issued within the next few months.

A new edition of the Catalogue of Conchological works offered for sale by the Section has been published, and more than half of the works have been sold and the proceeds handed over to the Treasurer.

Respectfully submitted by

GEO. W. TRYON, JR., } *Publication*  
 S. R. ROBERTS, } *Committee.*  
 EDW. J. NOLAN,

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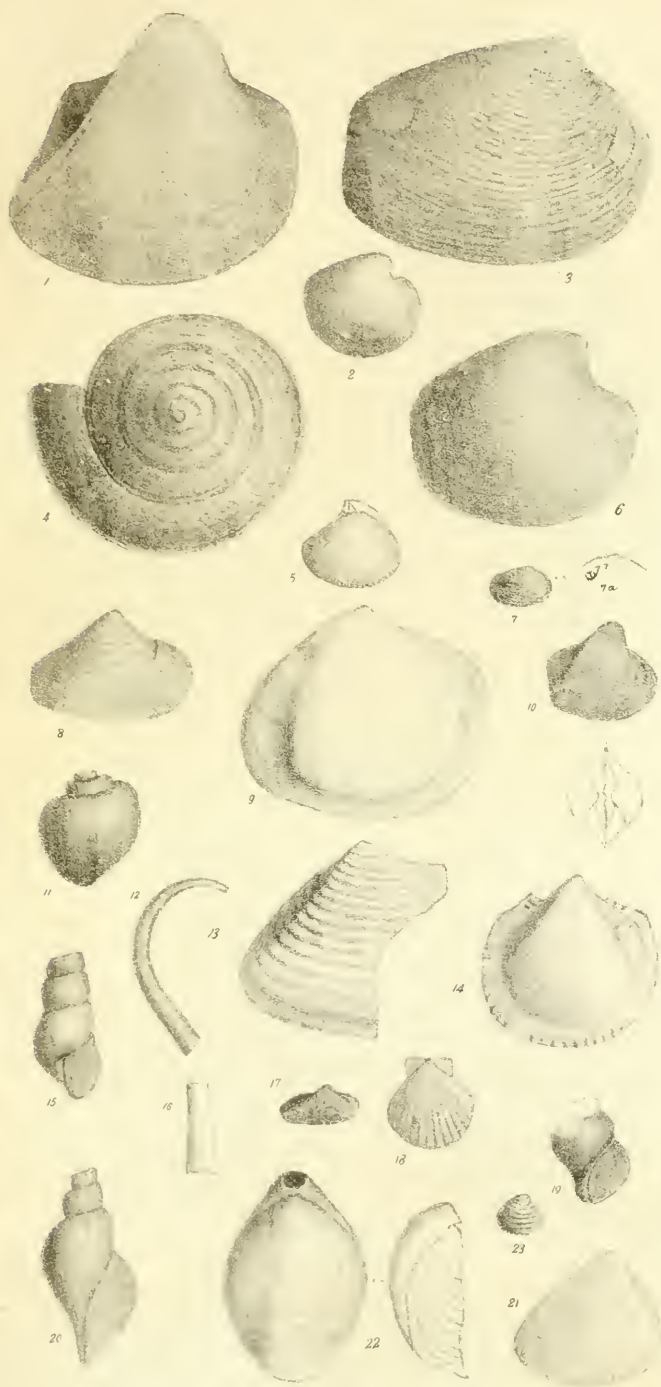
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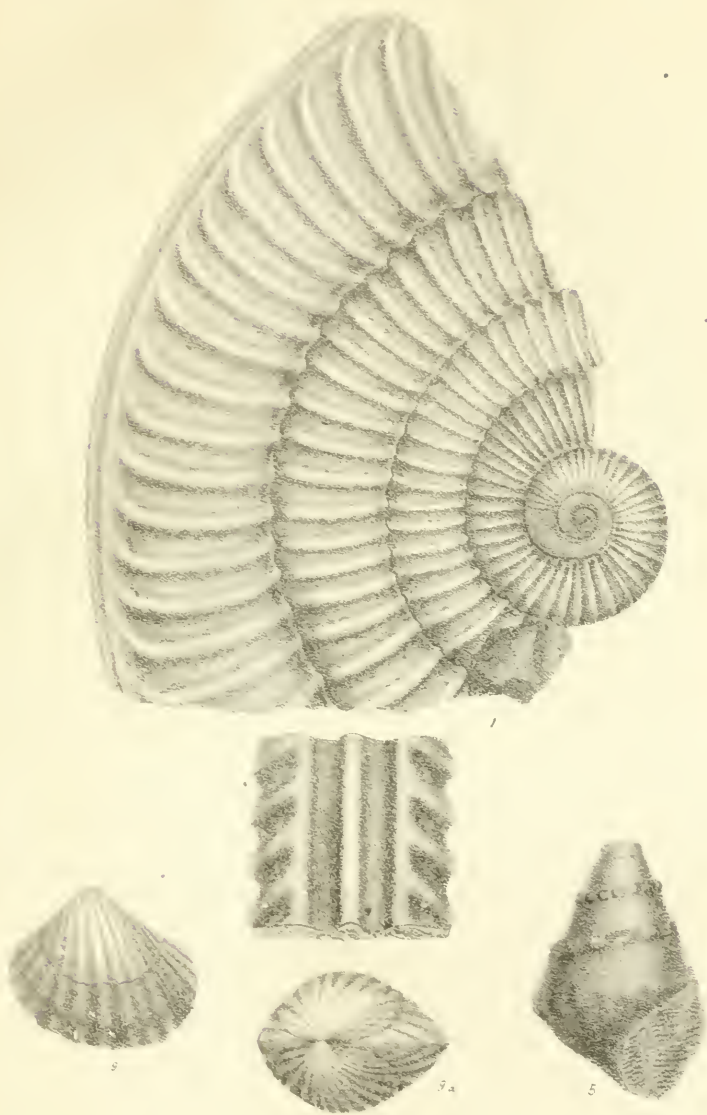








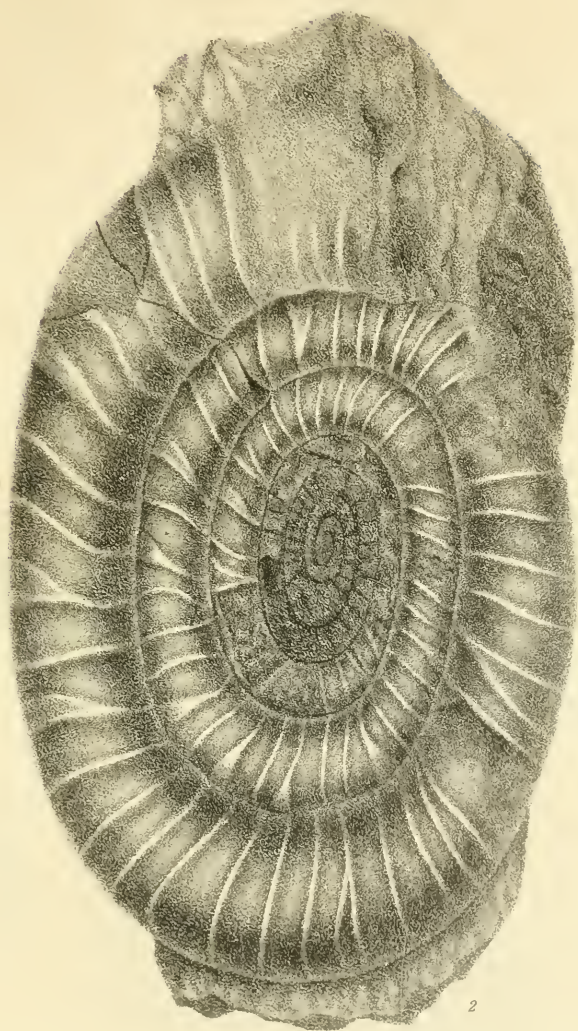




*Cobb's new Secondary Fossils.*

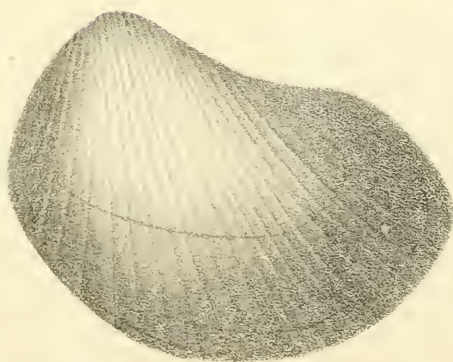
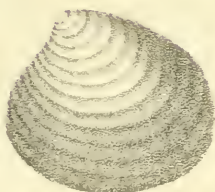
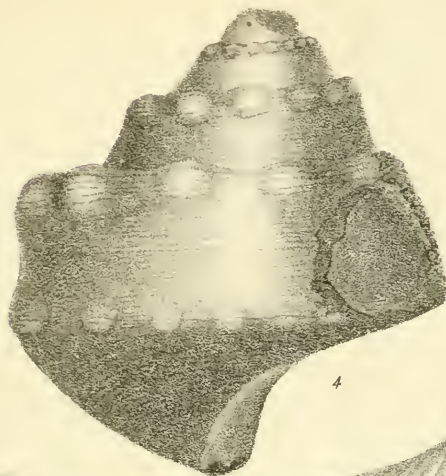
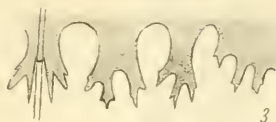






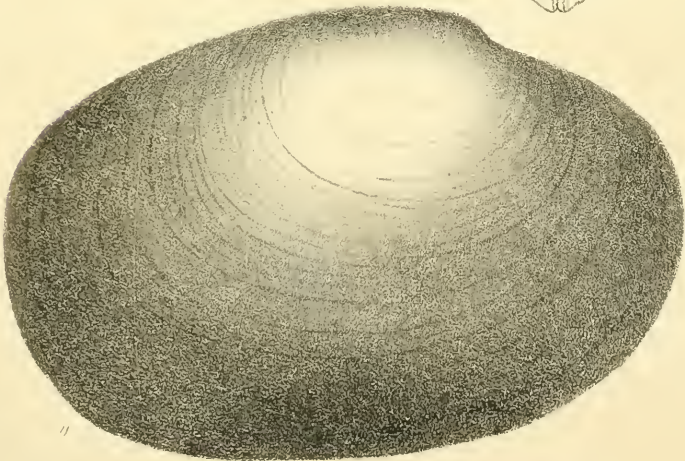
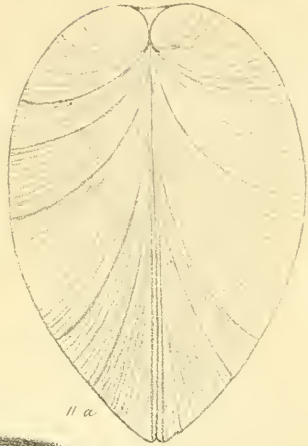
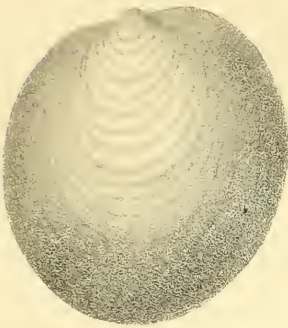
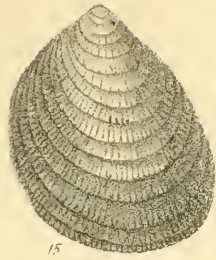
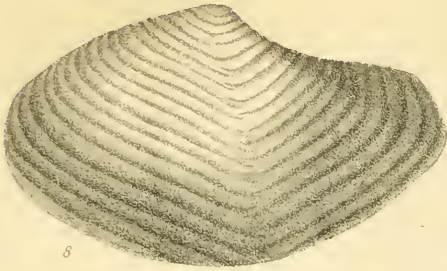
*Gabb's new Secondary Fossils.*





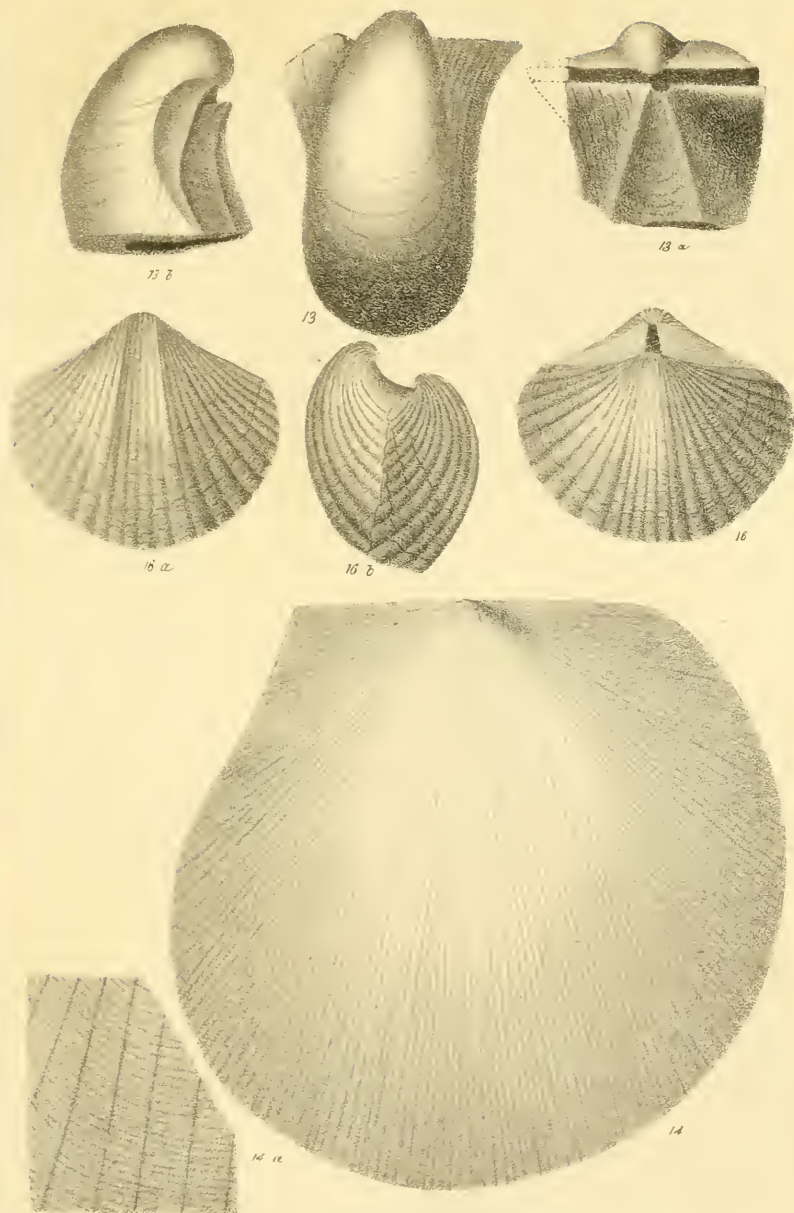
*Gabb's new Secondary Fossils.*











*Gibbs's new Secondary Fossils.*



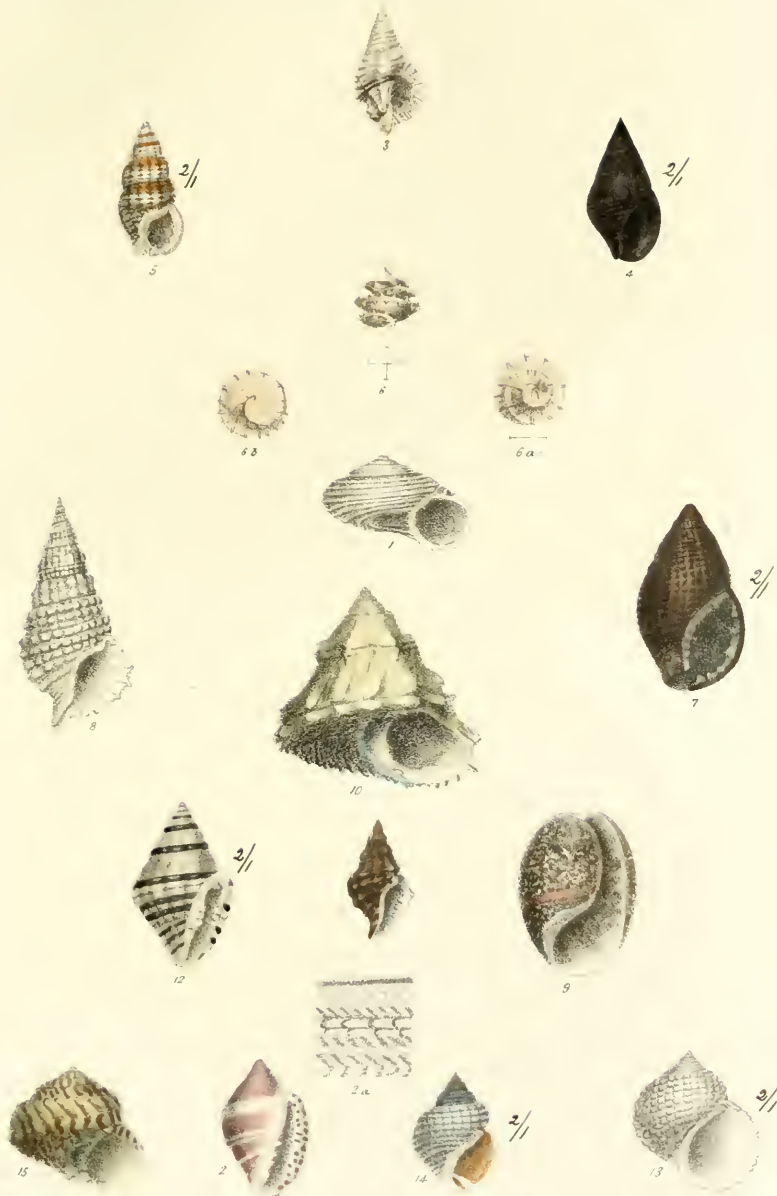
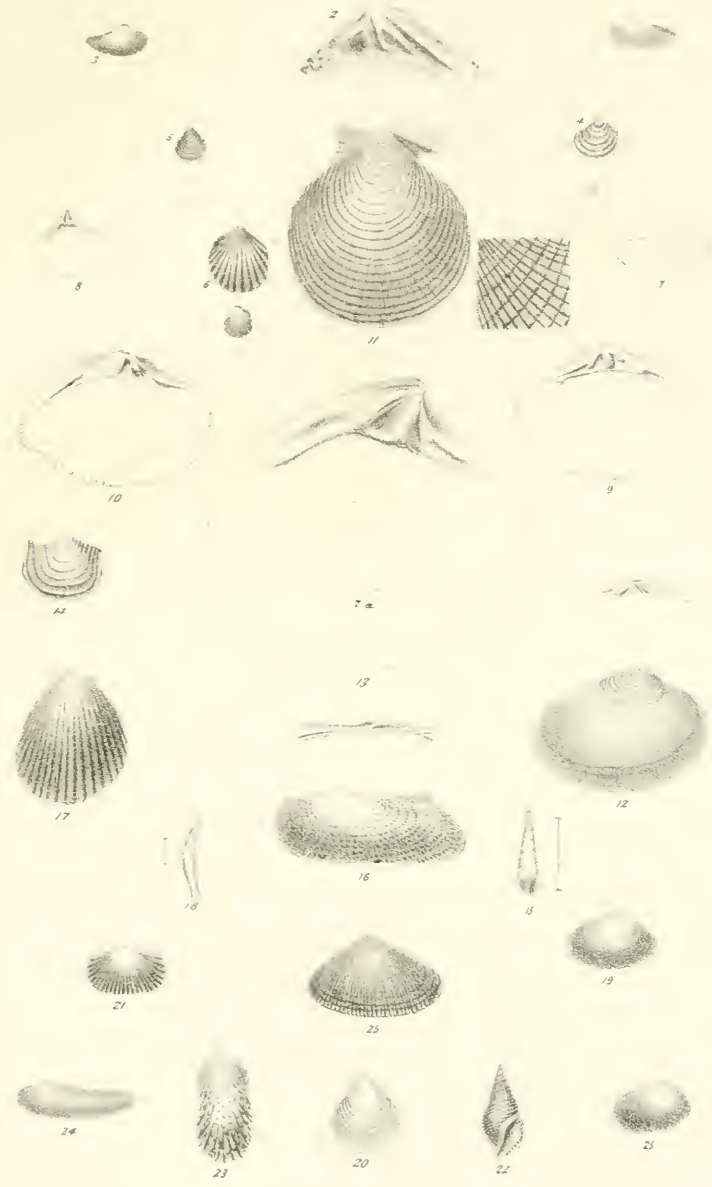


Fig. 1 *Helix Haydeni*, Gabb  
 " 2 *Marquiniella vexillum*, Redfield.  
 " 3-15 *Pease On new Polynesian Mollusca*.









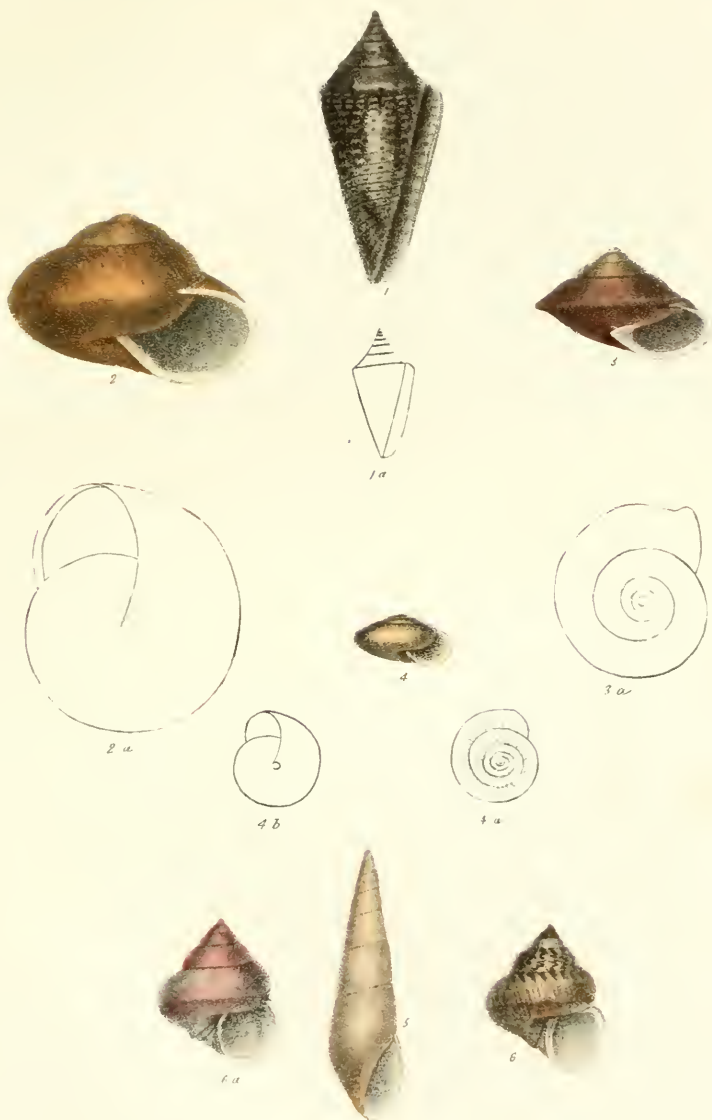
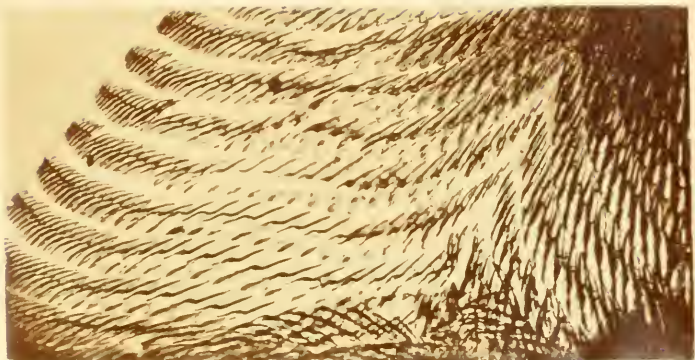


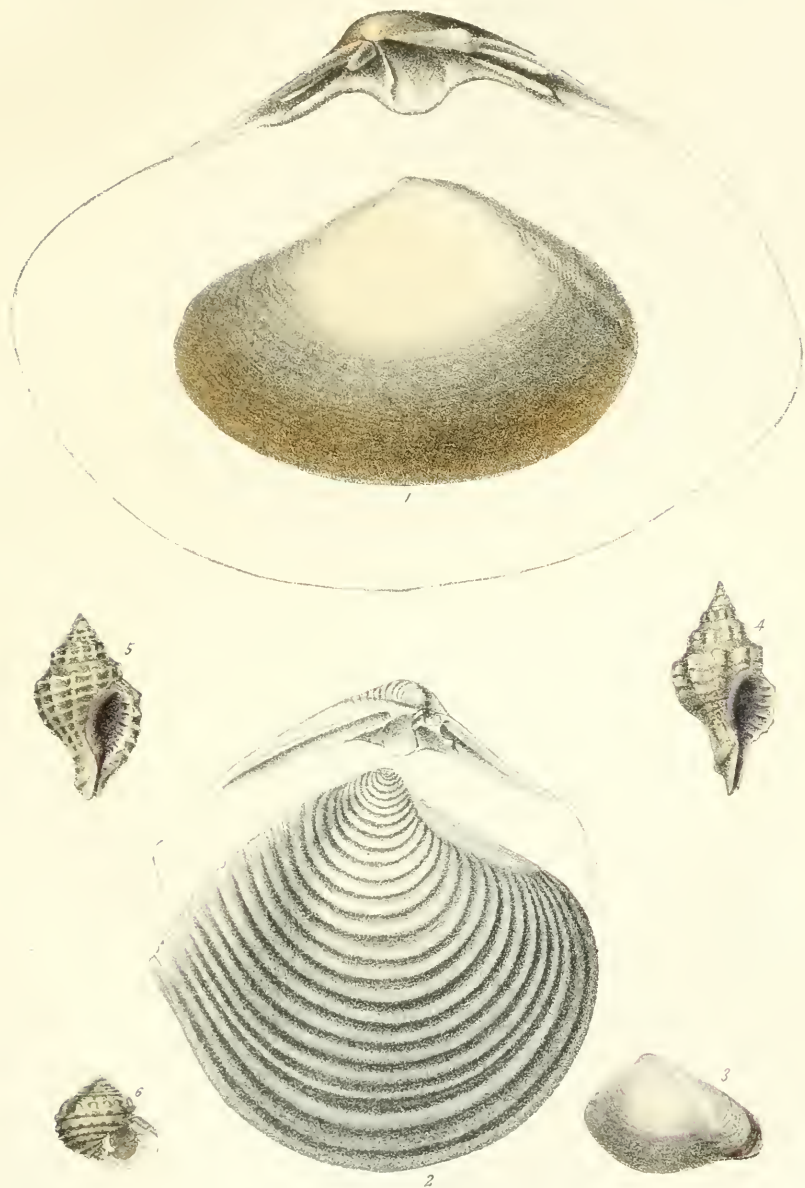
Fig 1 *Conus Stearnsi*; Conrad.  
 „ 2-6 *New Andamanese Mollusca*.





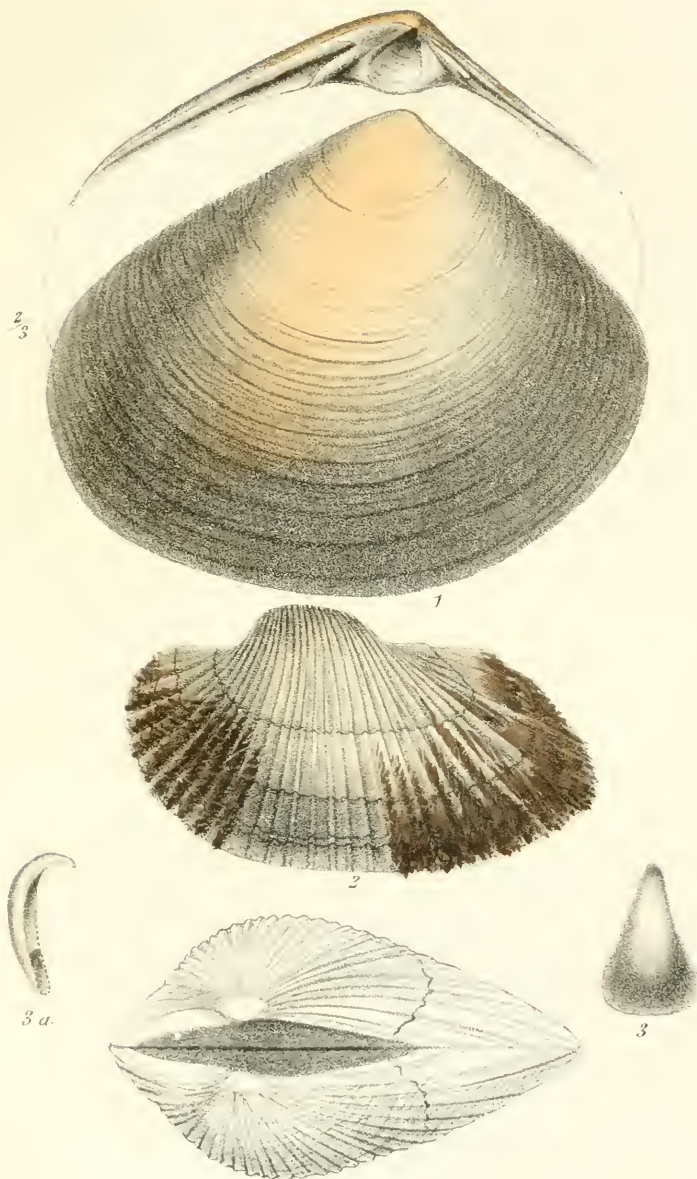
1. *Pupa palanga*.—Lingual Membrane.
2. *Cylindrella rosea*.—Jaw.







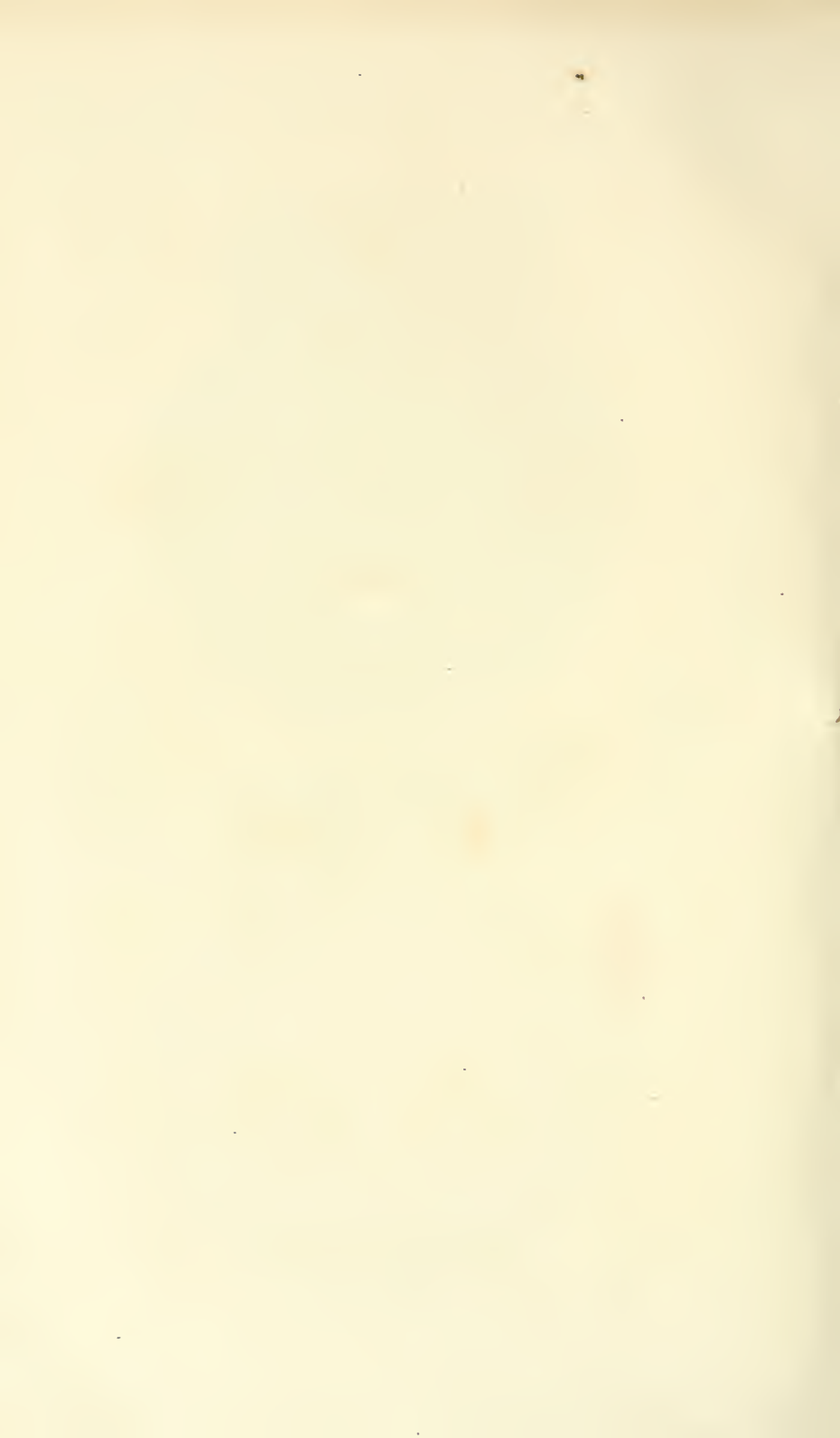


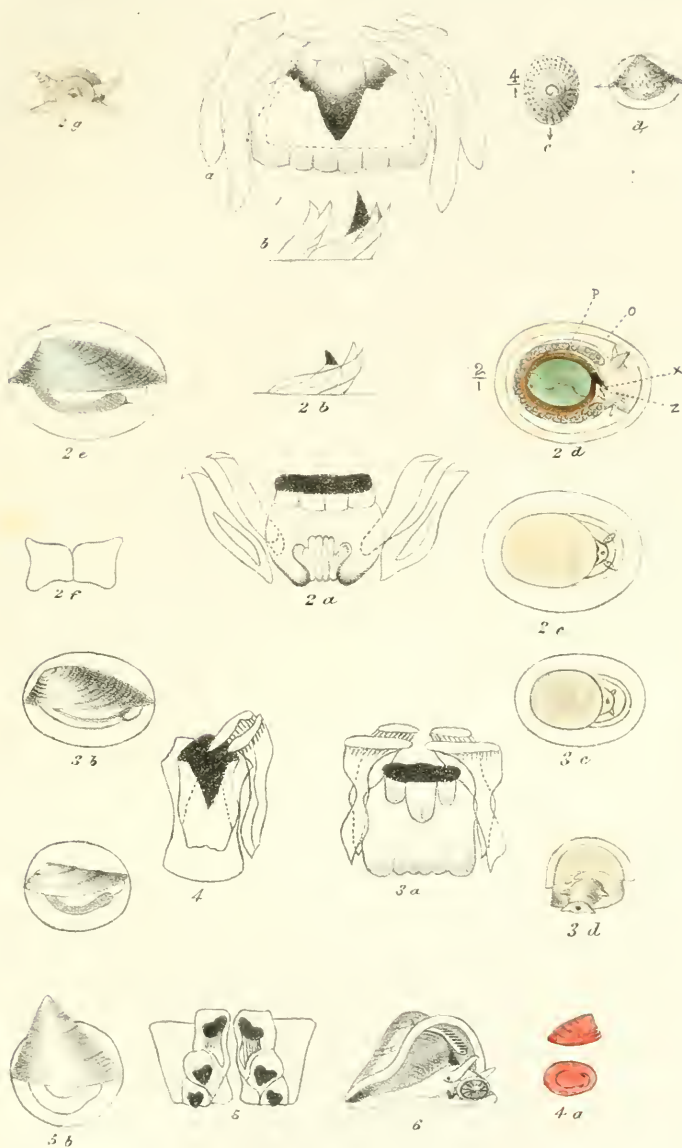






*Tryon On new Marine Mollusca.*











*Tate, Shells of Nicaragua.*  
*Tryon, On New Marine Mollusca.*







STORAGE

